

J O H N S O N S
A R I T H M E T I C K

Libris - In Two Books: *In Long*

The first of Vulgar Arithmetick,
With easie Rules to work all the first four
parts of Arithmetick, in whole
Numbers and Fractions.

The second of Decimal Arithmetick:

Whereby all Fractional Operations are
wrought in whole Numbers in Merchants Ac-
counts, without Reduction, with the perfect
working of Interests and Annuities.

By J O H N J O H N S O N ,
Surveyor, and Practitioner in the Mathematicks.

The Ninth EDITION.

Whereunto is added Tables of Interest, exactly
calculated at 6 per cent. with other Tables as
the Reduction of Weights, value of Leases and
Annuities, the weight and value of English
Gold; Rebate at 6 per cent. very delightful and
profitable.

L O N D O N ,
Printed by J. Fleisher, for Robert Horn, and
are to be sold at his Shop, at the South-En-
trance of the Royal Exchange, in Cornhill, 1671.

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*To the Right Honourable and worshipfull the
Merchant Adventurers of London and Bristol.*

The very Arts (Right Honourable and Worshipful) which were wont to bear the attributions of *honestæ & liberales*, seem now to temporize, and to have learned the New-found skill of Equivocation. For, howsoever the former of these denominations adhereth constantly unto the Professors of the Mathematick Sciences, yet the other which was once derived à *liberalitate*, and then intimated that they were anciently accustomed to perform liberal recompense to their Lovers and Followers, hath now (to spare cost) purchased a different Etymology à *libertate*, as properly accommodate to such as are *liberi*, free-born, or (as our peculiar term carried it) Freemen. Which being so, and seeing that in this particular, as well as in many other of great consequence, *Tempora mutantur* : I am thereby enforced to make up the old verse, adding, & *nos mutamur in illis*; and to apply my long experience, together with tedious studies bestowed in this present Art of Numbers, to the use and behoof of those persons to whom by the general appellation it properly belongeth, namely to the studious thereof in these honourable Cities. Which is the cause that I presume (without further self praise of what I have brought more useful, more easie, or more certain and delightfull in the Operations then hath been seen before) to present my labours to your Honourable and Worshipful judgments, to whom I owe of duty, whatsoever can be of me performed, to the furtherance of Art and the honour of these noble Cities, and the worthy Companies therein.

*Your Honours and Worships devoted
in all humble respect.*

JOHN JOHNSON

Surveyor.

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The Epistle to the Reader.

Gentle and courteous Reader, having for many years past spent my time both in reading, practising and conferring with others in and about the study of the Mathematical Sciences; and through great pains and travel at the request of divers worshipful Gentlemen, Merchants, and others of my very loving friends, I have at last collected and gathered together many excellent Rules and easie Abbreviations in the Science of Arithmetick, which at the intreaty, and by the means and help of some of them, I have at last made bold here to present abroad unto the Worlds view, the first Fruits of some idle hours study; the most part whereof I do acknowledge to have gotten by the practice and use of the most excellent Instrument invented by Mr. *William Prat*, called, *The Jewel of Arithmetick*, in which I have done the best of my endeavours not to hide that talent in the Earth, which God hath bestowed upon me for the benefit of others; but rather to his great glory and praise, and for the benefit of my Country, and for the furthering of all that are studious in the Art of Numbers, I have laboured to set it forth in the most brief, plain, and easie manner that I could, fit for the understanding of the weakest and meanest capacity. In which if any thing shall seem obscure or doubtful to any man, I could wish my self were present to resolve his doubts: for I have endeavoured to make the Rules as brief, short, and easie as I could devise.

In my first Book I have treated concerning *Vulgar Arithmetick*, with new inventions of my own; in all the first four parts of *Arithmetick*, viz. in *Addition* and *Subtraction*, with two severall kinds of *Multiplication*, not charging of the memory, never before ex-

tant

To the Reader.

tant in any Author that I have read, with 4 several kinds of Division, the later of them bringing the proof by *Addition* of the figures under the Dividend, without any multiplication or casting away of nines according to the accustomed manner.

Again, In the work of *Fractions* I have set them forth in plain and perfect figures, after another manner of mine own invention; because the fractional figures in most Books of Arithmetick were so unperfect, that they were scarce to be discerned, and in this manner they will perform all fractional operations, as well as if they were set out according to the usual manner. In the end of which Rules I have shewed the reasons and proofs of *Fractions* by the known parts of Coin.

Thirdly, In the second part of the former Book, I have set forth *Reduction* both in Coin sterling, weights, measures, time and motion; the Tables whereof are in the first part of the Book, with divers Rules how to bring pence or farthings at the first work into pounds, shillings, and pence; with divers questions wrought by *Reduction*; with *Progression* Arithmetical, and Geometrical, with examples:

And lastly, I have shewed how to work the Rule of *Three* of Direct and Converse, both in whole Numbers and Fractions, after divers several manners of working; and how to find the Divisor in any question as also divers ways to work *Fellowship*, *Barter*, *Exchange Allegation*, *Interest*, *Position*, and all other operations Arithmetical, with Examples and brief Rule of every part.

In my second Book of *Decimal Arithmetick* I have first described out the parts and use of the *Decimal Table*, and how to set forth any number given in *Decimals*.

The Epistle, &c.

Secondly, I have shewed how to work all the several parts of Arithmetick, *viz.* Numeration, Addition, Substraction, Multiplication, and Division in Decimals, with examples and proofs of every work in the known parts of Coin.

Thirdly, I have handled in as brief manner as I could, the *Rule of Three, Fellowship, Barter, Exchange* and *Interest* in *Decimal Arithmetick*, as before in *Vulgar*, in which you may perceive the great labour that is avoided in *Vulgar Arithmetick*, with divers examples and proofs of the same.

Lastly, I have added a small Treatise of *Interest* and *Annuities*, with the manner how to calculate Tables, or Breviates at any rate or years purchase given: All which I have drawn into a pocket-volume.

And thus hoping of your friendly censure and acceptance of these fruits of my labours, I cease, hoping to have my true endeavours and meaning well taken; desiring a blessing from God upon these my poor labours, wishing all happiness to the *London* and *Bristol Merchant*, and to all others, I take my leave,

John Johnson.

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A Table of Names, weights, and Valuation of all English Gold.
The agreement of 100 weight at London, with other parts beyond Sea.

The Stationer to the Reader.

THe Courteous Reader may take notice, that whereas the Vulgar parts of this Arithmetick were to brief and obscure for Learners in the former Impressions, they are now made more easie by the addition of many plain Examples: So that the meanest capacities may receive a greater benefit, and the Ingenious nothing prejudiced; as also the additions of many exact Tables of Interest at 6 per cent. of Rebate at 6. per cent. Tables of Annuities, Valuation of Leases, Reduction of Weights; the Names, Weight, and Value of English Gold, very delightful and profitable: So that it is esteemed by Ingenious Accomptants, the most compendious piece of this Subject extant.

J. S.

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JOHNSONS

ARITHMETICK.

CHAP. I.

Of Numeration.

Numeration is the first part of Arithmetick, which shews how to express and pronounce the true value of any number by ten Figures or Characters, whereof the tenth is a Cypher, signifying nothing of it self, but being joyned with figures, increaseth their value; the shape of the 10 figures with their single value, is as followeth,

one, two, three, four, five, six, seven, eight, nine, cypher.

1. 2. 3. 4. 5. 6. 7. 8. 9. 0.

How to express and pronounce the value of any number.

Any number under nine, is expressed by
B the

the single figures above; but to express a number above 9, Observe these Rules following in a number above one figure, that figure next the right hand, is the place of unites, and signifies but his own single value, as the figure of 1 signifies but one, the figure of 4 but 4, 8 but eight, and so of the rest: but where two or more figures are joynd together, the figure in the second place toward the left hand, signifies ten times his single value. As for example, the figure of 1 placed on the left side of a figure or cypher, signifieth ten thus, 10, the figure of 3 placed thus, 30, thirty, 8 placed thus, 80, eighty, as in these examples following.

11	Eleven,	46	forty six,
12	twelve,	52	fifty two,
16	sixteen,	58	fifty eight,
21	twenty one,	66	sixty six,
25	twenty five,	78	seventy eight,
28	twenty eight,	97	ninety seven,

A figure in the third place towards the left hand, signifies one hundred times his single value; as in these examples.

100	one hundred,	200	two hundred;
442	four hundred forty two,		
765	seven hundred sixty five,		
999	nine hundred ninety nine, &c.		

A figure in the fourth place toward the left hand, signifieth one thousand times his single value, as 1000 one thousand, 8642 eight thousand six hundred forty two. A figure in the fifth place signifieth ten thousand times his single value, as 10000 ten thousand; a figure in the sixth place toward the left hand, signifieth one hundred thousand times his single value, as 654732, six hundred fifty four thousand seven hundred thirty two; in the seventh place a figure signifieth his single value in millions, in the eighth place 10 times his value in millions; in the ninth place one hundred times his single value in millions; in the tenth place one thousand times his single value in millions; in the eleventh place, ten thousand times his single value in millions; and so infinitely, names may be given for the true value of any figure in any place.

Now to express any number consisting of many figures, make a period or distinction with your pen, between every 3 figures, beginning at the right hand; as in this Example, consisting of Twelve Figures, 123.456.789.101. or a distinction with a stroke thus, 123|456|789|101.

By what hath been already said, the value

lue of any figure in any of these twelve places, may be understood. Yet for the better pronouncing of any such great number, take notice that the first period of three figures toward the right hand, is the place of unites, tenes, and hundreds; the second period is the place of unites, tens, and hundreds of thousands: the third period is the place of units, tens, and hundreds of Millions: the fourth period is the place of unites, tens, and hundreds of thousands of Millions: So if you would pronounce the whole number distinctly, read thus; one hundred twenty three thousand four hundred fifty six millions, seven hundred eighty nine thousand one hundred and one. These rules being observed, there is no number though consisting of many figures, but may be readily expressed and pronounced by the meanest capacity: now take notice that *Numeration* hath four parts, *Addition*, *Subtraction*, *Multiplication*, and *Division*, by which all Arithmetical operations are performed. The next part necessary to be learned, is *Addition*.

Of Addition,
CHAP. II.

5

Of Addition.

Addition is that part of Arithmetick which serveth to add or collect together divers numbers or sums of several denomination, and to express their total value in one sum: for the understanding thereof, always observe to place the numbers or sums of the like degree one under another, that is, place Unite under Unite, tenth under tenth, and in coins pound under pound, shillings under shillings, and pence under pence: As for example, suppose the number 4235, and 2432 be two numbers given to be added together, that is, how much will the two numbers make in one? Place them one under another, and draw a line underneath, as in this example,

4235

2432

Then add together the two first figures towards the right hand, being in the place of unites, which is 2 and 5, say, 2 and 5 make 7, which 7 place under the line in the place of unites thus,

4235

2432

7

B 3

Then

Of Addition.

Then add the two next figures under one another, in the place of tenth, which is 3, and 3. say 3 and 3. makes 6, which place under the line in the place of tenth, thus,

$$\begin{array}{r} 4235 \\ 2432 \\ \hline 67 \end{array}$$

Then add together the two next figures, which is 4 and 2, they will make 6, which place under the line in his proper place, thus,

$$\begin{array}{r} 4235 \\ 2432 \\ \hline 667 \end{array}$$

Then add the two Figures in the fourth and last place, being 2 and 4, which is 6, and place it under the line, as in this Example.

$$\begin{array}{r} 4235 \\ 2432 \\ \hline 6667 \end{array}$$

So that 4235 and 2432 being added together, makes 6667.

Another example of more Numbers, if you desire to know what the total value of these four Numbers added together, will amount unto, place them one under another,

Of Addition.

7

ther, drawing a line under them, as is here expressed,

$$\begin{array}{r} 6723 \\ 3456 \\ 4575 \\ 6723 \\ \hline \end{array}$$

Then add the figures in the Unites place together, being the first Row towards the right hand ; say, 3 and 5 is 8, and 6 is 14, and 3 is 17 : here you are to observe in the adding of any numbers, for so many tens there is in the place of Unites, so many times one must you add to the place of tenth ; and so many tens there is in the place of tenth, so many times one must be added to the place of hundreds ; as in this example here you have 17 in the place of units, therefore place 7 under the line in the units place, thus,

$$\begin{array}{r} 6723 \\ 3456 \\ 4575 \\ 6723 \\ \hline \end{array}$$

7

And carry one to be added to the place of tenth, saying, 1 and 2 is 3, and 7 is 10, and 5 is 15, and 2 is 17 ; place 7 under the line in its proper place, thus,

B 4

9723

Of Addition.

6723

3456

4575

6723

 77

And for the 10 carry 1 to the next place, saying, 1 and 7 is 8, and 5 is 13, and 4 is 17, and 7 is 24, place the 4 under the line thus :

6723

3456

4575

6723

 477

And for the 20 carry 2 to be added to the next, and proceed saying, 2 and 6 is 8, and 4 is 12, and 3 is 15, and 6 is 21. Now in regard you finished your sum, place your 21 under the line thus :

6723

3456

4575

6723

 21477

By which may be perceived that the four numbers being added together, makes 21477. Observing these divers directions, you may add as many numbers together as you

you please. For the adding of money, weights, measures, time and motion, take the Rules following.

In Addition begin to add your sums at the right hand with the smallest numbers or denominations first, and gathering of their total, mark how many of the smaller makes one of the next greater; as if your Addition be farthings, for every four farthings carry one penny in mind to be added to the numbers in the place of pence, and for every 12 pence put one shilling into the number of shillings and for every 20 shillings one pound into the place of pounds; and therefore to know how many of the smaller denominations make one of the next greater, I have here added in this place the several Tables of Coyn sterling, of Weights, of liquid Measure, and dry Measures, of long Measures, of Time and Motion; which are very necessary to be known of every practitioner in Arithmetick, before he proceeds any farther in the practice of Arithmetick, being used in every particular Rule of Arithmetick more or less.

The Table of Coyn Sterling.

Four farthings makes	Pence	Farth.
one penny—	1	4
One shilling is—	12	48
One pound sterling is		
20 shillings—	240	960
One hundred pound		
sterling is—	24000	96000

Example.

l.	s.	d.	l.	s.	d.
785976	17	3	324	8	11
80254	10	7	222	17	3
23547	11	0	187	10	2
7853	12	2	354	12	1
248	00	0	1856	00	2
93	10	1	7859	1	11
7	11	3	3275	1	9
<hr/> Sum 897981	<hr/> 12	<hr/> 4	<hr/> 14079	<hr/> 12	<hr/> 3

The Explanation of these Examples.

In the example toward the Right hand, I begin with farthings, which are 3, which I set down : then next 9 pence and 11 is 20, and

Of Addition.

11

and 2 is 22, and 1 makes 23, and 2 makes 25, and 3 makes 28, and 11 makes 39 pence or 3 shillings 3 pence; I set down the 3 pence, and carry in minde the 3 shillings to be added to the place of shillings. Then add the several summs of shillings, which are 1. 1. 2. 7. 8. the total is 19, and the 3 in minde makes 22 shillings; set down the 2 shillings, and keep two tens to be added to the tens of shillings, which are 3 tens, which makes 5 tens, or 50 shillings; set down the odd ten to the two shillings, which makes 12 shillings, and carry 2 pound for the 40 shillings to the next place of pounds, which are 5 9. 6. 4. 7 2. 4 and the 2 in minde makes 39; leave the 9 under the place of unites, and carry 3 tens in minde, and 7. 5 5. 5. 8. 2. 2. total is 37, set down the 7 under the place of tens, and carry 3 in minde for the 30 tens, which is 3 hundred: then 3 in minde, and 2. 8. 8. 3. 1. 2 3. total is 30, set a cypher or 0 in the place of hundreds, and carry 3 for the 30 into the place of thousands; then last of all 3 in minde, and 3, 7, 1, makes 14 thousand: and because it is the last sum, you must set them all down, placing the 4 under the place of thousands, and the 1 one place more toward the left hand, and then the total sum

off

of those particulars will be 14c 79 pound 12 shillings 3 pence 3 farthings, as appeareth in the example :: and in the like manner is the other example to be cast up into one total : and so I will here end with addition of Coin, and put a several example of every Table for the full Tables and perfect understanding of the said Table, which are of great use in all the several Rules of Arithmetick.

The Table of Averdupois weights.

<i>Averd. the pound:</i>	<i>oun.</i>	<i>dra.</i>	<i>scrup.</i>	<i>Grain.</i>
One pound is	16	128	384	7680
One half pound is	8	64	192	3840
One quarter of a pound is	4	32	96	1920
One eighth of a pound is	2	16	48	960
One sixteenth of a pound is	1	8	24	480

<i>The hundred.</i>	<i>pon.</i>	<i>Oun.</i>	<i>dram.</i>	<i>Scrup.</i>
One hundred is	112	1792	14336	43008
One half hundred is	56	896	7168	21504
One quarter hundred is	28	448	3584	10752
One half quarter hundred is	14	224	1792	5376

Examples:

Examples of Weights.

C.	qu.	li.	oun.	C.	qu.	li.	oun.	dra.
27	3	27	6	127	3	17	8	3
18	1	17	12	118	2	10	12	1
13	2	10	3	33	0	0	0	0
73	0	0	5	17	1	12	2	3
83	2	5	12	22	3	1	7	0
<u>2</u>	<u>2</u>	<u>2</u>		<u>17</u>	<u>0</u>	<u>10</u>	<u>3</u>	<u>0</u>
				2	1	2		
216	2	5	6	336	3	24	00	7

The Explanation.

In the Averdupois weight, 20 grains make one scruple, 3 scruples one dram, 8 drams one ounce, 16 ounces one pound, 112 pound in one hundred of the Averdupois weight, whereby is sold all kind of Merchandise usual in this Realm, and therefore in Addition of weights Averdupois, for every 3 scruples add one dram, and for every 8 drams one ounce, and for 16 ounces one pound, and 28 pound one quarter of a hundred, and for every four quarters one hundred. First, I begin with the drams in the first example to the right hand, which are 3, 1, 3. total is 7 drams, which I note down underneath, because they

they are less then one ounce. Secondly, the ounces are 3, 7, 2, 12, 8, total is 32 ounces, or 2 pound, because 16 ounces is one pound; which 2 I set under the place of pounds, with a light touch of the pen for to remember it the better, and place a cypher in the place of ounces. Thirdly, the pounds are, 2, 10, 1, 12, 10, 17, total is 52 pound which is one quarter of a hundred, and 24 pound, put one quarter, as before, in the place of quarters of hundreds. Fourthly, 1, 3, 1, 2, 3, quarters, are 10 quarters, or 2 hundred and 2 quarters, or half a hundred; place 2 quarters in the place of quarters, and put over 2 into the place of hundreds for the 8 quarters. Then 2, 7, 2, 7, 3, 8, 7, makes 36 hundred, place 6, and carry 3 for the 30: then say, 3, 1, 2, 1, 3, 1, 2, total is 13, place 3 there, and carry one for the 10, which one in minde, and 1 and 1 makes 3, which set down, and the total is 336 hundred, 2 quarters, 24 pound, 0 ounces, 7 drams; and so the other example is in the same manner to be cast up, and so of all other.

The

Of Addition.

15

The Table of liquid measures.

	<i>Pints</i>
One pound or pint, ———	1
One quart ———	2
One pottle ———	4
One Gallon ———	8
Eight Gallons a Firkin of Ale, Sope, or Herring ———	64
One Firkin of Beer ———	72
One Firkin of Salmon, or Eccles ———	85
Two firkins or one kilderkin of Beer ———	144
Two Kilderkins, or one Barrel ———	288
One Tierce of wine ———	336
63 Gallons one Hogshead of wine ———	504
Two Hogsheads, or a pipe or Butt ———	1008
Two Pipes, Butts, or a Tun of wine ———	2016

The Table of dry Measures.

	<i>Pints</i>
One Pint ———	1
One quart ———	2
One pottle ———	4
One Gallon ———	8
One Peck ———	16
Four pecks, one bushel land-measure ———	64
Five Pecks one Water-Bushel ———	80
Eight Bushels one quarter ———	512
Four quarters one Chaulder ———	2048
Five Quarters one Wey ———	2560

The

The Table of long Measures.

	<i>Inch.</i>
Three Barly Corns in length, one Inch.	1
One Foot	12
One Yard, or 3 foot	36
Or 3 Foot 9 Inches, an English Ell	45
Or 6 Foot 1 Fathom	72
Or 5 yards and half a pole or Perch	198
Or one Perch in breadth, & 40 long, one Rood	193
Or 4 Perches breadth, and 40 long, an acre of Land	792
160 Square Perches is one Acre	792
40 Rodds in length is one Furlong, and 8 Furlongs is an English Mile.	

The Table of Time.

	<i>Minut.</i>
One Minute	1
One Hour	60
One Day natural, or 24 Hours	1440
One Week, or 7 Days	10080
One Moneth, or 4 Weeks, or 28 Dayes	40320
12 Moneths, one Day, 6 Hours, or 365 Dayes, one Year.	525960

The

The Table of Motion.

360 Degrees, 21600 Minutes	12 signes.
129600 Seconds	1 Signe.
30 Deg. 1800 min. 108000 sec.	1 Degree.
1 Deg. 60 min. 3600 sec.	1 Minute.
1 Min. is 60 seconds	1 Second.
1 Second	
7776000 Thirds, make the 12	1 Third.
Signes	
466560000 Fourths make the	1 Fourth.
12 Signes	
27993600000 Fifths is 12 signs	1 Fifth.
1679616000000 Sixths is 12	1 Sixth.
Signes	

The Explanation of these Tables, and the examples following.

First, in the example of Acres, Roods, and Perches, for 40 Perches put one Rood into the place of Roods, and for every four Roods one Acre.

Secondly, for every four quarters of inch, take one inch, and for every 12 inches one foot, and for every 3 foot one yard.

Thirdly, for 16 pintes take one peck, and for every four pecks one Bushel, into the place of Bushels.

Fourthly,

Fourthly, for every 8 pints of liquid measure, take one Gallon, and for every 63 Gallons one Hogshead.

Fifthly, in the example of time, for 60 minutes take one hour, and for 24 hours one day, and for 365 days one year.

Sixthly, for 4 nails take one quarter of a yard, and for 4 quarters one yard, &c.

Lastly, in the example of motion, for 60 thirds, take one second, and for 60 seconds take one minute, and for 60 minutes take one degree, and for 30 degrees take one sign.

And this is the use of these Tables in *Addition* and *Subtraction*; for look what you carry over in *Addition*, that you must borrow in *Subtraction*. I will here add examples of every kind, leaving the Reader to exercise himself by the Rules before taught.

Example.					
<i>Acres.</i>	<i>Rood.</i>	<i>Per.</i>	<i>Feet.</i>	<i>Inch.</i>	<i>Quart.</i>
127	3	2	124	7	3
245	1	12	246	11	4
17	3	22	134	7	2
27	1	8	120	8	0
37	0	17	72	10	2
<hr/>					
2	2		03	2	
456	2	00	1699	9	3

Bushells,

Of Addition.

19

Bushels, Pecks, Pints.			Yard, Quar. Nail.		
127	3	11	127	2	3
256	1	7	359	1	4
345	0	0	152	3	0
184	2	10	16	0	0
<hr/>			<hr/>		
1	1		1	1	
913	3	12	656	3	3

Years, days, hours, min seconds.

356	245	16	35	20
249	100	12	30	00
756	12	00	10	12
140	27	30	25	02
1618	00	20	00	00
<hr/>				
1	3	1		
<hr/>				
312	22	07	40	34

Signes, degrees, minutes, seconds, thirds.

11	22	32	24	18
8	19	17	20	12
10	07	00	08	15
2	17	35	50	59
3	29	30	12	00
<hr/>				
3	1	1	1	
<hr/>				
37	05	55	55	44

The proof of Addition,

The proof of *Addition* is made by *Subtraction*

fraction, for if you subtract the numbers which you added, from the total of the Addition, there will remain nothing if the work be truly done.

Example.

<i>l.</i>	<i>s.</i>	<i>d.</i>	<i>q.</i>
378567	19	10	1
240023	10	2	0
854326	07	1	0
785604	13	5	2
320500	00	11	1
2	2		
<hr/>			
<i>Total.</i> 2579052	11	4	0

First, add together the greatest sums in value in the place of hundred thousands, which makes 23, which take from 25, and there will remain 2, then the figures in the fifth place 26 taken from 27 there will remain 1. Thirdly, the figures in the place of thousands, make 17, which taken from 19, leaves 2, then 19 in the place of hundreds taken from 20, leaves 1: and again, 13 in the place of tens from 15, leaves 2: and lastly, 20 in the place of unites from 22 pound leaves 2 pound: then 49 shillings from 2 pound 11 shillings, leaves 2 shillings:

Of Addition.

21

Numbers
e Ad-
work

lings : also 2 shillings 3 pence in the place of pence, from 2 shillings 4 pence, leaves 1: and last of all, 4 farthings from one penny, leaves nothing, which proves the work to be truly wrought.

	l.	s.	d.	q.
the total.	xxixxx	xx	4	0
	xxxxxx	x	3	0

The second proof of Addition.

Cut off the uppermost numbers with a dash of the pen, and add the remainder into one total : and then subtract that sum from the whole total, and the remainder will be the numbers which you cut off, if the work be true, else not.

Examples

	378 567	19	10	1	
	240023	10	2	0	
	854326	7	1	0	
	785634	13	3	2	
	32050000		11	1	
Total	2579052	11	4	0	of all
Subst.	2200484	11	5	3	the sum.
The	378567	19	10	1	proof.

And so much shall suffice to have spoken of Addition, and the proof thereof.

Questions

Questions of Addition.

What number is that, to the which if you do add 45, the total will be 357.

Answer, Subtract 45 from 357, remains 312.

Example.

$$\begin{array}{r} 357 \\ 45 \\ \hline 312 \end{array}$$

What three numbers are those, to which if you add 27, 36, and 45, their products shall be equal, and the sum arising shall be 120.

Proof.

120	120	120	93
27	36	45	27
<hr/>	<hr/>	<hr/>	<hr/>
93	84	75	120

What number is that, to the which if you do add 354 pound, 7 shillings 9 pence, the totall will be 512 pound, 15 shillings, 0 penny? *Answer,* Subtract 354 pound, 7 shillings 9 pence, from 512 pound, 15 shillings, 0 penny, and the remainder will be 158 pound 7 shillings 3 pence, which is the number that you do seek.

Example.

Exam

SU
or nu
great
supp
poun
to i
213
the
sub
be f
you

rig
the
un

Of Subtraction.

23

Example.

l.	s.	d.
512	15	0
354	7	9
<hr/>		
158	7	3

CHAP. III.

Of Subtraction.

Subtraction is that part of Arithmetick, which serveth to deduct or take one sum or number from another, the less from the greater, and produce what there remains: As suppose there be delivered or received 6342 pounds, Sheep, Oxen, (or what you please to imagine) and have disposed of them 2131, how many will there remain? Place the greater number from which you would subtract, and then place the lesser number to be subtracted under it, drawing a line with your pen, as in this example.

6342
2131

Then take the first Figure towards the right in the number to be subtracted from the Figure over it, and place what remains under the line; that is, take 1 from 2, and there

there remains 1, which one place thus,

$$\begin{array}{r} 6342 \\ 2131 \\ \hline 1 \end{array}$$

Then take the next in the place of tenth, and place the remainder under the line even with the rest, that is, take 3 from 4, and the remainder is 1, which 1 place under the line thus,

$$\begin{array}{r} 6342 \\ 2131 \\ \hline 21 \end{array}$$

Then come to the third place, and take 1 from 3, and there remains 2, which place under the line even with the rest, thus,

$$\begin{array}{r} 6342 \\ 2131 \\ \hline 211 \end{array}$$

Then take the fourth from the fourth, which is 2 from 6, and there remains 4 which place under the line thus,

$$\begin{array}{r} 6342 \\ 2131 \\ \hline 4211 \end{array}$$

By which you may perceive that 2131. being taken from 6342, there remains 4211, the proof of *Substraction* is by *Addition*,

Of Subtraction.

25

that is, add what remains to the number subtracted, and if they both make your first number, it is right, if not, it is wrong: as in the former example, add 4211, the remain, to 2131, they make 6342. Thus your first number,

6342

2131

4211

6342

Another example of Subtraction: I would take 1648 from 2537, and know what remains, place them as in the former example, the greater number first, and the lesser under it: thus

2537

1648

Then take the lower number from the upper, and place the remainder under the line, that is, take 8 from 7 you cannot, therefore borrow ten from the place of tenth, which make 17, then take 8 from 17, and there remains 9, which 9 place thus,

2537

1648

9

C

Observe

Observe, that as in *Addition* for every ten you had in the first place you were to add one to the second place : so on the contrary in *Subtraction*, for every ten you want in the first place, you are to take from the second : so here the first you borrow from the second place, which is the figure of 3, there is but 2 remains ; then proceed to the second figure, and take 4 from 2, the which you cannot therefore as in the former, borrow from the next, and take 4 from 12. and there remains 8, which 8 place thus,

$$\begin{array}{r} 2537 \\ 1648 \\ \hline \end{array}$$

89

Then take 6 from 4, that you cannot, but take 6 from 14, and there remains 8, which place under the line thus,

$$\begin{array}{r} 2537 \\ 1648 \\ \hline \end{array}$$

889

Then take 1 from 1, and there remains nothing, by which you may perceive that 1648 taken from 2537, there remains 889 the which you may prove by adding (as was directed in the former example.)

2537

Of Substraction

27

$$\begin{array}{r} 7532 \\ 1648 \\ \hline 889 \\ \hline 2537 \end{array}$$

Here follows divers Examples with their proofs.

A third Example.

Borrowed	678912
Paid	489345
Remain	<u>189567</u>
Proof	678912

A fourth Example.

Borrowed	1040603090
Paid	10690842
Remain	<u>1029912248</u>
Proof	1040603090

A fifth Example.

Delivered	1000000000
Received	987654321
Remain	<u>012345679</u>
Proof	1000000000

For the substracting of Money or Coin, of Weights, Time and Motion, observe the following Rules.

C 2

Place

Place your greater number, from which the *Substraction* is to be made in the uppermost part, and the number to be substracted, or deducted right underneath, every figure under his like kind, or denomination, viz. pounds under pounds, shillings under shillings, and pence under pence, &c. in this manner.

	<i>l.</i>	<i>s.</i>	<i>d.</i>	<i>q.</i>
<i>Lent.</i>	7756	13	10	1
<i>Paid.</i>	3949	17	11	2
<i>Rest.</i>	3806	15	10	3
<i>Proof.</i>	7756	13	10	1

Then begin your subtraction at the left hand at the smallest numbers; but if the lowest figure of the undermost numbers be the greatest, that it cannot be abated out of the number above it, then add one of your next greater denominations, and make your subtraction from both, noting the remainder: as if you have 10 pence to take from 7 d. add one shilling, or 12 pence, unto 7 d. that maketh 19 d. then take 10 pence from 19 pence, and there will remain 9 pence, which note down under the 10 pence: and because you did borrow one shilling, therefore in the number of shillings you shall take away one more then it is, in the
next

next place of shillings; and this rule is general in Coyn, Measure, Time, Motion, or any thing else whatsoever.

1 Example of Subtraction of Coyn.

	l.	s.	d.	q.
<i>Lent.</i>	789786	17	11	3
<i>Paid.</i>	692583	19	10	1
<i>Rest.</i>	97202	18	1	2
<i>Proof.</i>	789786	17	11	3

The Explanation of these Examples.

In the first example of Coyn, begin your *Subtraction* at the right hand, saying, 1 farthing from 3 farthings, leaves 2 farthings which note down under the first farthing. Then 10 pence from 11 pence, leaves 1 penny. Thirdly, 19 shillings from 17 shillings you cannot have, therefore take one pound or 20 shillings, and add to 19 shillings, saying, 19 shillings from 37 shillings, rests 18 shillings, which note down. Then 1 that you borrowed, and 3 pound, is 4 pound from 6 pound, leaves 2 pound to set down under 3. Then 8 from 8 leaves nothing, place there a Cypher or 0 under 8. Then 5 from 7 rests 2, then 2 from 9 leaves 7, which also note again, 9 from 8 cannot be taken,

C 3

then

then make it 10 more, and say, 9 from 18 leaves 9, which set down: and last of all, 1 borrowed and 6 is 7, from 7 leaves nothing, and the work is ended, and the remainder will be 97202 pound, 18 shillings 1 penny 2 farthings, as appeareth in the example beforegoing,

2 Example of Weights.

C.	q.	li.	oun.
Lent	127	3	27 10
Paid	38	2	24 15
Rest.	89	1	2 11
Proof.	127	3	27 10

The Exposition of this second Example

First, take 15 ounces from 10, which cannot be, then add 1 pound, or 16 ounces to 10, makes 25, then say, 15 from 26 leaves 11 ounces which note down: then 1 borrowed, and 24 is 25 from 27 pound leaves 2 pound remaining: then 2 quarters from 3 quarters leaves 1 quarter remaining; then 8 from 7 cannot be, then take 8 from 17, rest 9, which note down: then 1 borrowed and 3 makes 4, from 12 rests 8, and the

Subtraction.

31

the work is done, and the remain is 89 hundred 1 quarter 2 pound, 11 ounces.

3 Example of Time.

	<i>Years.</i>	<i>Days.</i>	<i>Hours.</i>	<i>Min.</i>
<i>Tot.</i>	1618	340	20	56
<i>Ded.</i>	1581	122	15	59
<i>Rest.</i>	0037	218	4	57
<i>Proof.</i>	1618	340	20	56

4 Example of Motion.

	<i>Sig.</i>	<i>Deg.</i>	<i>Min.</i>	<i>Sec.</i>	<i>Thirds.</i>
<i>Tot.</i>	11	22	36	52	40
<i>Subst.</i>	7	29	51	42	56
<i>Rest.</i>	3	22	45	09	44
<i>Proof</i>	11	22	36	52	40

3 Example.

First, take 59 minutes from 56 minutes cannot be, but then take 59 minutes from 60 minutes, or 1 hour, and there will remain 1 minute; which add to 56 minutes

C 4

and

that will make 57 minutes, which note down in the place of minutes : then 1 borrowed and 15 hours makes 16 hours, which taken from 20 hours leaves 4, which note under the 15, and then 2 days from 0 cannot be, but 2 from 10, and there will remain 8, which note down : then 1 borrowed and 2 makes 3, from 4 leaves 1, also 1 from 3 leaves 2 : lastly, 1 from 8 leaves 7, and 8 from 11 leaves 3 ; then 1 borrowed and 15 makes 16, from 16 leaves nothing, and the remainder will be 37 years 218 days, 4 hours, 57 minutes ; the like is done in the other example of Motion, and therefore here needless to be rehearsed.

To Subtract from an Unite.

Set down with your pen a Unite in any place, adding Cyphers unto it, and the several numbers which you will subtract from it of pounds shillings and pence, write underneath : then note what each several number of your lowest numbers do want of 9 unto the place of Unites, and set that right under for the remainder ; and lastly, note what your shillings and pence doth want of 20 shillings, and set that down for your remainder, and the work is ended.

Example.

Example.

	l.	s.	d.
Lent.	1000000	00	00
Paid.	232864	17	03
Rest.	767135	2	9
Proof.	10000	0 60	00

The Proof of Subtraction.

The surest proof of *Subtraction* is made by *Addition*; for if you add the numbers remaining, unto the total of the numbers deducted, they will return your former sum if the work be truly wrought, as will appear in the proof of all the several examples before going; and therefore here again in this place needless to be rehearsed. Only I will add one for example sake.

In the last example, the numbers which did remain, were 767135 pound 2 shillings 9 pence, and the numbers deducted, 232864 pound 17 shillings 3 pence, these 2 numbers added together, ought to make a unite in the seventh place; wherefore I add 9 d. to 3 pence, makes 1 shilling, and 1 shilling to 17 shillings makes 18 shillings, and 2

C 5 shillings

shillings makes 20 shillings, then 1 and 4 is 5, and 5 is 10, which is one in the next place, then 1 and 3 and 6 is 10, and 1. 1. 8 makes 10, and 1. 7. 2. makes 10, and 1. 6. 3. is 10, and lastly, 1. 7. 2, makes 10, or one more.

CHAP. IV.

Of Multiplication.

M*ultiplication* is that part of Arithmetic by which is multiplied one number by another, to the end their product may be known. *Multiplication* is a speedy way of *Addition*, as to know what 3 times 252 is, or 8 times 9; it is not to put down 252 3 times, or 8 times 9 one under another, and so cast them up, but to multiply 252 by 3, as shall be shewn hereafter.

In *Multiplication* there is three parts, the Multiplicand, the Multiplier, and the Product; the Multiplicand is the number given to be multiplied, the Multiplier is that number by which you multiply, the product is that which is Produced by

Multiplication.

35

by the multiplication: so if you multiply 5 by 4 the product will be 20; for 4 times 5 is 20. Here the 5 is the Multiplicand, 4 the Multiplier, and 20 the Product.

Multiplication is either single or compound; single *Multiplication* is when the Multiplicand and Multiplier consist of one single figure.

To know the multiplication of any single figure, here followeth a perfect Table,

The Table of Multiplication.

1	2	3	4	5	6	7	8	9
2	4	6	8	10	12	14	16	18
3	6	9	12	15	18	21	24	27
4	8	12	16	20	24	28	32	36
5	10	15	20	25	30	35	40	45
6	12	18	24	30	36	42	48	54
7	14	21	28	35	42	49	56	63
8	16	24	32	40	48	56	64	72
9	18	27	36	45	54	63	72	81

The use of this Table is, if you desire to know what the product of any number under 9 being multiplied by any single figure, first find one of your numbers in the uppermost

36.

Multiplication.

uppermost row, and the other in the row downward towards your left hand, and in the Angel where the two figures meet you have the product; as for example, 8 multiplied by 6 you will find to be 48, 6 by 6 is 36, 6 by 7 is 42, and so of the rest; it will be very necessary for those that desire to be expert in Arithmetick, to learn this Table by heart, which may easily to be done, most of it being natural to the meanest capacity, if they can but read, as who knows not that 3 times 3 is 9, 3 times 4 is 12, 4 times 5 20, 4 times 6 24, and the like.

In compounded *Multiplication*, that is, when you would multiply any number consisting of any figures, as if you multiply 3421 by 2, that is, how much is 2 times 3421, place your multiplicand first, and then place your Multiplier under it, drawing a line under them with your pen thus,

3421

2

Then proceed to the *Multiplication*, and say 2 times one is 2, which 2 place under thus,

3421

2

2

Then

Then multiply the second figure, say 2 times 2 is 4, which place under thus,

3421

2

42

Then multiply the third, which is 4, say 2 times 4, is 8, which place under the line thus,

3421

2

842

Then multiply the last, 2 times 3 is 6, which place under thus,

3421

2

6842

By which you may perceive that 3421 multiplied by 2, makes the product to be 6842.

The second Example in which the multiplier consists of 2 figures, if you multiply 4562, by 24, that is, how much is 24 times 4562? Place them as formerly directed, your greater number first, and the lesser underneath, drawing a line under them thus,

4562

24

And

And multiply the upper number by the first figure of the Multiplier, say 4 times 2 is 8, set 8 under the line, and multiply the next, 4 times 6 is 24, set down 4 and carry 2 to be added to the next, say 4 times 5 is 20, and 2 is 22, set down 2, and carry 2 to be added to the next, then say 4 times 4 is 16, and 2 is 18, which 18 put in its proper place, and cancell the figure of 4, then it stands thus,

$$\begin{array}{r} 4562 \\ \times 4 \\ \hline 18248 \end{array}$$

Then multiply the multiplicand, or the upper number by the second figure of the Multiplier being 2, say 2 times 2 is 4, and 2 times 6 is 12, set down 2, and carry 1 to the next, 2 times 5 is 10, and 1 is 11, set down 2, and carry 1 to the next, 2 times 4 is 8 and 1 is 9, set down 9; the which being done, cancel the second figure, and it stands thus,

$$\begin{array}{r} 4562 \\ \times 2 \\ \hline 1824 \\ 9134 \end{array}$$

Then add your two numbers together, it will be the product, which is 109488 being the product of 4562 multiplied by 24.

Multiplicand

Multiplication.

39

Multiplicand 4562*Multiplicator* 29

Product 13248

9124

Total is 139488

The third Example, where the Multiplier consists of three figures.

87968 *Multiplicand.*987 *Multiplier,*

First begin (as hath been formerly shew-
ed) your multiplication at the right hand,
saying, 7 times 8 makes 56 place 6 under
the 7, and keep 5 in mind to be added to
the product of the multiplication of 7 by 6,
saying 7 by 6 makes 42, and 5 in mind is
47, set 7 under the 6, and keep 4 in mind,
then 7 by 9 is 63, and 4 makes 67; set 7
down, and keep 6 in mind: then 7 by 7 is
49, and 6 is 55, place 5 and keep 5 in mind:
lastly, 7 by 8 is 56, and 5 is 61, which set
down the 1 first, and the 6 one place more
towards the left hand, and so the multi-
plication by the first figure is done, then
cancel the 7 of your multiplier, and your
work will stand as in this example,

87968

Multiplication.

$$\begin{array}{r} 87968 \\ 987 \\ \hline \end{array}$$

615776

Secondly, begin with 1, the second figure of your multiplier, saying 8 times 8 is 64, place the 4 under the said 8, and keep the 6 in mind: then 8 by 6 is 48, and 6 makes 54: set down 4 in the next place, and keep 5 in mind: then 8 by 9 is 72, and 5 makes 77; set down 7, and keep 7 in mind, then 8 by 7 is 56, and 7 makes 63, set down 3, and keep 6. Lastly, 8 by 8 is 64, and 6 makes 70, set the 0 first, and the 7 one place more towards the left hand, and cancel the 8 of your multiplier, and the work will stand thus,

$$\begin{array}{r} 87968 \\ 987 \\ \hline \end{array}$$

615776

703744

Thirdly, begin with 9, the last figure of your multiplier, saying 9 by 8 is 72, place the 2 under the said 9, and keep 7: then 9 by 6 is 54, and 7 is 61: place 1, and keep 6: then 9 by 9 is 81, and 6 is 87; place 7, and keep 8: then 9 by 7 is 63, and 8 is 71: place 1, and keep 7: last of all, 9 by 8 is 72, and 7

is

Multiplication.

41

is 79 : place the 9 first, and the 7 one place more towards the right hand, and the whole work is ended, then gather the total by Addition.

87968 *Multiplicand.*987 *Multiplier.*

7615776

03744

791712

86824416

*Product.**The fourth Example with Cyphers.*703286501 *Multiplicand.*32057 *Multiplier.*

4923005507

3516432505

14065730020

2109859503

22545255362557

*Product.**The Exposition of this Example.*

First, 7 by 1 is 7, which note down : then 7 by 0 is 0, set down a 0 in that place : and next 7 by 5 is 35, set 5 and carry 3 ; then 7 by 6 is 42, and 3 is 45, place 5, and carry 4 ; then 7 by 8 is 56, and 4 is 60, set down a 0, and carry 6. again : 7 by 2 is 14, and 6 makes

makes 20, set down a 0 and carry 2: then 7 by 3 is 21, and 2 makes 23; place 3 and carry 2: then 7 by 0 is 0, leave the 2 in that place: then lastly, 7 by 7 is 49, being the last number, set down all the 9 under 7, and the 4 one place more to the left hand, and the work will then stand thus.

$$703286501$$

$$32057$$

$$4923005507$$

Secondly, cancel 7, and then say, 5 by 1 makes 5, place that 5 under the 0; and then 5 by 0 is 0, place an 0 under the 5 in the next place; and then 5 by 5 is 25 set down 5, and carry 2: then 5 by 6 is 30, and 2 makes 32, set down 2 and carry 3: then 5 by 8 is 40, and 3 makes 43, place 3 and carry 4: also 5 by 2 is 10, and 4 makes 14, set down 4, and carry 1: then 5 by 3 is 15, and 1 makes 16, set down 6 and carry 1: then 5 by 0 is 0, set down the 1 there: last of all 5 by 7 is 35, set them all down, and the work will then stand thus,

$$703286501$$

$$32087$$

$$4923005507$$

$$3516432505$$

Thirdly, cancel the 5, and then say, 0 by

I is

Multiplication.

43

1 is 0, place 0 under the 0 of your multiplier, and then proceed to the next figure of your multiplier, which is 2, saying, 2 by 1 is 2, place the 2 under the said 2 of your multiplier: then 2 by 0 is 0, which set down: then 2 by 5 makes 10; set down a 0, and carry 1: then 2 by 6 is 12, and 1 is 13, set down 3 and carry 1: also 2 by 8 is 16, and 1 is 17, set down 7 and carry 1: also 2 by 2 is 4, and 1 makes 5, which set down: again, 2 by 3 is 6, which set down: lastly, 2 by 7 is 14, which set down: and the work will stand as in this example.

703286501

32887

4623005507

3516432505

14065730020

Fourthly, cancell the 2 and say, 3 by 1 is 3, which place right under the said 3: then 3 by 0 is 0, and work in all respects as before, and the work being ended, will stand thus,

Multiplicand.

Multiplier

703286501

32887

4923005507

3516432505

14065730020

2109859503

Product

2254553662557

1

Multiplication.

I will here add some few examples to be wrought by the pen, without any troubling of the memory, or bearing ought in mind.

*1 Example.*87968 *Multiplicand.*987 *Multiplie .*

46456

56932

57464

64628

68572

72314

86824416*Product.**2 Example.*79648039 *Multiplicand.*8976 *Multiplier.*

53240154

42464808

64250263

49328601

85370281

63146207

74360272

56282404

714920798 064*Product.**The*

Multiplication.

45

The explanation of the work by pen, without charging the memory.

The first Example. 87968

987

First, I multiply all the figures of my multiplicand by 7, the lowest figure of my multiplier, saying, 7 by 8 is 56, put 6 under the 7, and 5 under the 8: then 7 by 6 is 42, leave the 2 under 5 last placed, and set the 4 one place more toward the left hand, under the 9: then 7 by 9 is 63, leave 3 under the 4 last placed, and set 6 one placed more to the left hand under 7: then 7 by 7 is 49, leave 9 under the 6 last placed, and the 4 set one place more to the left hand under the 8: lastly, 7 by 8 makes 56, leave 6 under the 4, and place 5 one space more toward the left hand, as before, then cancel 7 of your multiplier, and the multiplication by the first figure is ended, and the work will stand thus,

Example.

$$\begin{array}{r} 87968 \\ 987 \\ \hline 46456 \\ 56932 \end{array}$$

Then for the second work, say 8 by 8 is 64, place 4 under the said 8, and put 6 under the next figure 3: then 8 by 6 makes 48, leave 8 under 6, and put 4 under the next 9: and

and so working in all respects as at the first, and your second work will stand thus, as in this example.

$$\begin{array}{r} 87968 \\ 987 \\ \hline 46456 \end{array}$$

$$\begin{array}{r} 56932 \\ 57464 \\ 64628 \end{array}$$

Lastly, cancel 8 your multiplier, and then multiply by 9 (as before is taught) placing the first figure of your Product under the figure multiplying, and the work being ended, it will stand thus : and lastly, gathering the total by addition, it is 86824416, as in this example.

$$\begin{array}{r} 87968 \\ 987 \\ \hline 46456 \end{array}$$

$$\begin{array}{r} 56932 \\ 5746 \\ 64628 \\ 68572 \\ 72314 \end{array}$$

Product. | 80824416

There is no difficulty in this kind of working, but onely when there falls an 0 in the mul-

multi
a Cy
as yo
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that
ing

Pro

Multiplication.

47

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hus,

multiplicand, or multiplier; for if there be a Cypher, then you must fill up the places as you work, either with pricks or Cyphers, as if you had figures to set in their places, and the rest of your work is, as before is taught in the third example; but I will here add one example, having all the difficulties that may happen for the better understanding hereof.

Example.

en
ing
the
n-
ng
in

$$\begin{array}{r} 70921034 \\ 1293 \\ 02000012 \\ 21076309 \\ 08100236 \\ 63018907 \\ 01000008 \\ 14084206 \\ 70921034 \\ \hline \text{Product} \quad 91700896962 \end{array}$$

Example.

*Multiplication.**Example.*

80073902147368
179852

00101000010116
16004680428462
000314010231340
40005550050550
00527010351464
64006420682648
00028010362572
72003710896374
00426010242564
56009130478912
80073902147368

14401451449028429536

*How to Multiply and to bring the Product
in the last line.*

Place your numbers right one under the other, as in the common way; then make a right line some-what distant from the first numbers with your pen, as in the example following.

87968

987

~~7847~~

615776

Then begin and say, 7 by 8 is 56, place the

the 6
above
next
6 is
leave
bove
above
set 6
7 by
leave
lastly,
make
line,
the e
distan
in the
Ex

Th
place
then
tween
and so

Multiplication.

49

the 6 under the line under the 7, and the 5 above the line in a smaller figure in the next place towards the left hand : then 7 by 6 is 42, and the 5 above the line makes 47, leave 7 under the 8, and set the 4 again above the line, then 7 by 9 is 63, and the 4 above the line makes 67 ; place 7 there, and set 6 in the next place above the line, then 7 by 7 is 49 and 6 above the line makes 55, leave 5 there, and put 5 again over the line ; lastly, 7 by 8 makes 56, and the 5 last placed makes 61, place that whole sum under the line, and that work will stand as above in the example. 2. Draw a line a little distant, as before from the last product, as in the example following.

Example.

87968

987

5643

615776

68671

765321

Then say 8 by 8 is 64, and 7 makes 71, place 1 under the 7, and set 7 above the line: then 8 by 6 is 48, and the two sevens between lines makes 62 ; place 2 under the 7, and set 6 again over the line, then 8 by 9

D.

is

is 72, and 6 makes 78, and 5 makes 83, place 3 under the line and 8 above the line: then 8 by 7 is 56, and 8 makes 64, and 1 makes 65, place 5 under the line, and set 6 above: lastly, 8 by 8 is 64, and 6 makes 70, and 6 makes 76, place them both down; and the work will stand as above in the example.

Thirdly, draw a line again as before, a little distant from the last product, as in this example.

<i>Example.</i>	87968
	987
	5645
	61577 6
	68670
	76532 1
	7967
	86824416 <i>Product.</i>

Thirdly say 9 by 8 is 72, and 2 makes 74, place 4 and put 7 over the line: then 9 by 6 is 54, and 10 makes 64, place 4 under the line, and put 6 above: then 9 by 9 is 81, and 11 above makes 92, leave 2 under the line, and 9 over the line: then 9 by 7 is 63, and 15 makes 78, leave 8 under the line, and 1 above: lastly, 9 by 8 is 72, and 14 makes 86, place

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6,
wil
bov
line
the
in
this
with
2
3
ylo
10
3
b
10
2
1
D
ained
not

Division.

98

place them both under the line, and then bring down the two figures which are cut off by two right down lines, which are 1 and 6, and the work is ended, and the work will stand as appeareth in the example above, and the total Product is in the last line, 86824416; and this doth not charge the memory, for all the figures are set down in view, and to be seen at the first sight; and this is the second kind of Multiplication, without charging the memory.

$$\begin{array}{r}
 79648039 \\
 \times 8978 \\
 \hline
 5324029 \\
 47788844 \\
 76462160 \\
 \hline
 605325096 \\
 86470390 \\
 \hline
 777374800 \\
 85470379 \\
 \hline
 714921798064
 \end{array}$$

CHAP. V.

Of Division.

Division is that by which we know how many times one number is contained in another, to the end we may find

D 2

the quotient as in *Multiplication*. So in *Division* are three parts: the *Dividend*, the *Divisor*, and the *Quotient*; the *Dividend* is the number given to be divided, the *Divisor* is the number by which we divide, the *Quotient* is the number produced by the *Division*; If 24 were given to be divided by 6, the number produced would be 4, because 4 times 6 is found in 24: here 24 is the *Dividend*, 6 the *Divisor*, and 4 the *Quotient*. As *Subtraction* is but the undoing of that which is done by *Addition*; so *Division* is the undoing of what is done by *Multiplication*; for if you multiply 6 by 4, the product will be 24: so if you divide 24 by 6, 4 will be the quotient; for the working of *Division*, you must place your dividend or number to be divided first, then under it place your *Divisor* or number by which you are to divide, as suppose you would divide 646 into 2 parts for your number thus,

Dividend 646 (*Quotient*.
Divisor 2

First, you must seek how many times 2 you have in 6, you will find 3 times, which 3 place at the right hand of the distinction in a line with the dividend, and then with your pen cancel your 2 and 6 thus,

3 2 646 (3

x

Then

Division.

53

Then set the Divisor under the next figure of the Dividend toward the right hand thus,

$$\begin{array}{r} 646 \ 3 \\ \times 2 \\ \hline \end{array}$$

And seek how many times you have 2 in 4, which is 2 times, that you must place on the right hand of the quotient of 6, and cancel your 2 and 4, then your work will stand thus,

$$\begin{array}{r} 326 \ 32 \\ \times 2 \\ \hline \end{array}$$

Then remove your Divisor to the next figure of the Dividend under 6 thus,

$$\begin{array}{r} 326 \ 323 \\ \times 2 \\ \hline \end{array}$$

And seek how many times 2 there is in 6, which is 3; the 3 you must place at the right hand of the quotient and cancel your 2 and 6, as here you see,

$$\begin{array}{r} 323 \ 323 \\ \times 2 \\ \hline \end{array}$$

So you will find that there is 3 times 323 in 646. The like may be done in the division of other numbers. Another example of division with one figure.

D 3

I would divide 65490 pound amongst 5 men; place your number 6 thus,

65490

Example.

Dividend. 65490 Quotient.
Divisor. 5

First, I seek how oft 5 is in 6, this I may have but once; then put 1, in the quotient beyond the crooked line, and take 5 out of 6, and there will rest 1, set that over 6, and then remove your Divisor one place more to the right hand, and then seek you how many times 5 may be had in 15, and the answer is thrice; therefore place 3 in the quotient, and by it multiply your Divisor 5, makes 15, which taken out of 15 leaves nothing, remove your divisor, and seek how oft you may have 5 in the 4 over it, but you cannot have it once; wherefore put an 0 in the quotient, and remove your divisor, and seek how many times you may have 5 in the figures over and behind it, which are 49, and you may have it 9 times, put 9 in the quotient, and by it multiply your divisor 5 makes 45, which taken from 49, leaves 4, which place above the 9. And lastly, remove again your Divisor 5 under the 0,

and

Division.

55

and seek how many times 5 is in 40, and you shall find it 8 times, place 8 in the quotient, and by it multiply 5, makes 40, which taken from 40 leaves nothing remaining; and the work is ended, and will stand thus, as in the example, and I find if I divide 65490 l. amongst 5 men, every man shall have for his part 13098.

$$\begin{array}{r} 65490 \\ 5 \overline{) 65490} \\ \underline{50} \\ 154 \\ \underline{15} \\ 490 \\ \underline{45} \\ 40 \\ \underline{40} \\ 0 \end{array} \quad \begin{array}{l} 13098 \text{ quotient} \end{array}$$

Another example with one figure: suppose there it 398 l. to be divided equally among 6 men, how much will one part be? Place first your dividend, and in regard you cannot take 6 out of 3, you must set your Divisor under the second figure, that is, under 9 thus,

$$\begin{array}{r} 398 \\ 6 \overline{) 398} \\ \underline{36} \\ 38 \\ \underline{36} \\ 2 \end{array}$$

And seek how many times 6 you have in 39. 6 times 6 is 36, take 36 from 39, there remains 3, place the 3 over the 9, and the 6 in the quotient, and cancel the 39 and the 6 thus,

$$\begin{array}{r} 398 \\ 6 \overline{) 398} \\ \underline{36} \\ 38 \\ \underline{36} \\ 2 \end{array}$$

Then remove your Divisor to the next place under the 8, and seek how many times 6

D 4.

you

you have in 38, you will find 6 times, and 2 over, place the 2 over the 8, and the 6 in the quotient, and cancel the 38 and 6 thus,

$$\begin{array}{r} 3 \overline{) 39} \\ \underline{18} \\ 21 \\ \underline{18} \\ 30 \\ \underline{18} \\ 12 \\ \underline{12} \\ 0 \end{array}$$

So there will be 66 pounds to each man, and 2 pounds over, that also divided into 6 parts, is 6 shillings 8 pence, in all 66 li. 6 shillings 8 pence. To prove it, multiply the quotient by the Divisor, add the two pound over it will make your dividend, that is, 6 times 6 is 36, and 2 is 38, and 6 times 6 is 36 and 3 is 39.

And this is the order of *Division* for one figure: but if your divisor do consist of more figures than one, then you must take the first figure of your Divisor no oftner out of the dividend, than you can also take every several figure of your Divisor, out of the same figures of the Dividend standing above them: as for example.

If you would divide 86824416 by 987, which was one of the products of the multiplications in the rules before-going, for a trial of your former work, then place your numbers as in the example following.

Example.

Division.

37

Example.

86824416 (8

987

Then I seek how oft I may have 9 in 86, I find I may have it 9 times; but if I consider the next figure 8 of my Divisor, I cannot have also 9 times 8 out of the numbers remaining: if I take 9 times 9 which is 81, out of 86, there will remain but 5: and then 9 times 8, the next figure of my Divisor, makes 72, which cannot be taken out of 58 which will remain: therefore I place 8 in the quotient, and by that I multiply all the figures of my Divisor, 987 makes 7896, which taken from 8682, leaves 786 above them: and the work will stand thus.

786
86824416 (8

987

7899

Secondly, I remove my Divisor 987 one place nearer the right hand, and then I seek how oft I may have 9 in 78, which I see I can have but 7 times, so I put 7 in the quotient, and by that 7 I multiply my Divisor 987, makes 6909, which taken from 7864, the numbers above them, there will remain 955, and the work will stand thus.

D 5

Example

58

Division.

Example.

95

888x4416 (87

9877

78969

698

98

Thirdly, again I remove my Divisor 587 one place nearer the right hand, and seek how many times I may have 9 in 95, and I find I may have it 9 times, which 9 I set into the quotient, and by it multiply 987 makes 8883, which taken from 9554 leaves 671, and the work will stand thus,

Example.

67

888

78651

888x4416 (879

98777

789693

893

88

Fourthly, I remove my Divisor again, and seek how oft I may have 9 in 67, and I see I can have it but 6 times, then I put 6 in the quotient, and by it multiply 987, makes 5922, which taken from 6711 leaves 789, and the work will stand as in the example following.

Example.

Division.

Example.

$$\begin{array}{r}
 67 \\
 9158 \\
 786519 \\
 868 \times 44 \times 6 \quad (8796) \\
 981111 \\
 7896932 \\
 8988 \\
 892 \\
 59
 \end{array}$$

Lastly, I remove my Divisor again, and seek how oft I may have 9 in 78, and I find I may have it 8 times, which I put into the quotient, and by it I multiply my Divisor, 987 makes 7896, equal unto the numbers above; and so being taken away, leaves nothing remaining, and proves the multiplication to be truly wrought, as appeareth in the example following.

Example.

$$\begin{array}{r}
 67 \\
 9158 \\
 786519 \\
 868 \times 44 \times 6 \quad (8796) \\
 981111 \\
 7896932 \\
 898886 \\
 8929 \\
 597 \\
 18
 \end{array}$$

Thee

The third example of Division.

The second kind of *Division* is this : first, place your *Divident* and *Divisor* as in the former examples, and then having found out the figure of your quotient, begin with the least figure of your *Divisor* towards the right hand first, and multiply that by the figure of the quotient found and then subtract the sum of the multiplication of that figure from the figure above the same, if it exceed not 9 ; but if the product be above 9, then for every ten bear one in mind to be added to the product of the multiplication of the second figure of your *Divisor* by the quotient ; and so in all respects work for every other figure, and you shall need make no more figures above your *divident* than necessity shall require, As for example.

I would divide the product of the Multiplication in the former Chapter of 79648039 by 8976, which was found to be as followeth, viz. 714920798064 by 8976 : first I place my *Divident* and *Divisor* as followeth.

Quotient.

Divident. 714920798064 (7
Divisor. 8976

Then first I seek how often I may have 8 in 71, I find by trial I can have it but 7 times :

times : then having placed 7 in the quotient, I first multiply 6, the least or smallest figure in value by 7, makes 42: then I say 42 from 42 rests 0, and carry 4 for the 40 in minde: the 2 I cancel the 2 over the 6, and place a 0 in the room over it. Secondly, I say, 7 by 7 is 49, and 4 in minde makes 53, from 59 leaves 6, and carry 5: cancel the 9, and place 6 over it. Thirdly, 7 by 9 is 63, and 5 in minde is 68, from 74 leaves 6, and carry 7, cancel the 4 and place 6 above it: also 7 by 8 is 56, and 7 makes 63, which taken from 71 leaves 8 remaining, which 8 place over the 1, and cancel the 71, and the first work will stand thus,

$$\begin{array}{r} 8660 \\ 7 \overline{) 74920798064} \end{array}$$

Secondly, I remove my *Divisor* 8976, and seek how many times I may have 8 in 86, I find 9 times: then I multiply 6 by 9 placed in the quotient, makes 54, which taken from 60, leaves 6: place 6 above the first 0 and carry 6 for the 60; then say 9 by 7 is 63, and 6 in minde makes 69, from 70 leaves 1 and carry 7 in minde; cancel the 0 over the 7, and place the 1 over the 0. Again, 9 by 9 is 81, and 7 in minde is 88, which taken from 96, leaves 8 to be placed above the first 6

Division.

6, and carry 9 in mind : lastly, 9 by 8 is 72 and 9 makes 81, which taken from 86, leaves 5 to be placed above the 6, and the work will stand as followeth..

Example.

581

86666

714920798064 (79

89766

897

Thirdly, again I remove my Divisor, and seek how many times 8 is in 58, and I find I can have it but 6 times, which I place in the quotient : then I say, 6 by 6 makes 36, from 37 leaves 1 above 7, and carry 3 : then 6 by 7 is 42, and 3 is 45, from 46 leaves 1 above the 6, and carry 4 : Again, 6 by 9 is 54, and 4 makes 58, from 61 leaves 3 above the 1, and carry 6. Lastly, 6 by 8 is 48, and 6 makes 54, from 58 leaves 4, and the work stands thus, as in the example,

43

881

86666

714920798064 (796

897666

897

89

Fourthly, I remove my Divisor, and seek how oft I may have 8 in 43, and I find but 4 times

4 times
by 6
2, set
make
gain,
leave
and 4
will

E.

how
which
by 8
the
65
and
8:
72
stand

Division.

63

4 times, I place 4 in the quotient. Then 4 by 6 makes 24, from 29 leaves 5, and carry 2, set 5 over the 9; then 4 by 7 is 28, and 2 makes 30, from 31 leaves 1, and carry 3. Again, 4 by 9 is 36, and 3 makes 39, from 41 leaves 2, and carry 4. Lastly, 4 by 8 is 32, and 4 is 36, from 43 leaves 7, and the work will then stand thus,

Example.

$$\begin{array}{r}
 72 \\
 43 \overline{) 308} \\
 86 \\
 \hline
 888 \\
 8916 \\
 \hline
 8911 \\
 899 \\
 \hline
 8
 \end{array}$$

Fifthly, I remove my Divisor, and seek how oft I may have 8 in 72: I find 8 times, which placed in the quotient, I multiply 6 by 8 makes 48, from 48 leaves 0, and carry 4 then 8 by 7 makes 56, and 4 is 60, from 65 leaves 5, and carry 6: then 8 by 9 is 72, and 6 makes 78, from 81 leaves 3, and carry 8: then 8 by 8 makes 64, and 8 is 72, from 72 leaves 0 remaining, and the work will stand thus,

Example.

Division.

Example

7
#323
#85555
8888850
754924798064 (77648)
89788888
897777
8999
88

Sixthly, I remove my Divisor, and seek how oft I may have 8 in 3, which I find not once; I place a 0 in the quotient, and remove my Divisor one place more, and seek how many times 8 is in 35: I find I can have but 3 times; I place 4 in the quotient beyond the cypher last placed, and say, 3 by 6 is 18, from 26 rests 8, and carry 2: then 3 by 7 is 21, and 2 is 23, from 30 leaves 7, and carry 3: again 3 by 9, is 27, and 3 is 30, from 30 leaves a 0, and carry 3: also 3 by 8 is 24, and 3 is 27, from 35 leave 8, and the work will stand thus.

Example:

Example.

$$\begin{array}{r}
 7 \\
 43 \times 38 \\
 58111507 \\
 8866611078 \\
 714921798064 \quad (7964803 \\
 8978888888 \\
 89777777 \\
 899999 \\
 8888
 \end{array}$$

Lastly, I remove my Divisor, and seek how oft I may have 8 in 80, I find 9 times; I place 9 in the quotient, and say, 9 by 6 is 54, from 54, leaves 0, and carry 5, then 9 by 7 is 63, and 5 is 68, from 68 leaves 0, and carry 6: then 9 by 9 is 81 and 6 is 87 from 87 leaves 0 and carry 8: last of all, 9 by 8 is 72, and 8 makes 80; from 80 there will remain nothing but cyphers, and the work is quite ended, and will stand as in the example following.

Example.

$$\begin{array}{r}
 7 \\
 43 \times 38 \\
 58111507 \\
 8866611078 \\
 714921798064 \quad (796489039 \\
 8978888888 \\
 89777777 \\
 899999 \\
 8888
 \end{array}$$

The

The fourth and last kind of Division is the most absolute, speedy, and easie, not charging the memory at all with keeping any numbers in mind; and also the proof of your work is made by *Addition*, and not by *Multiplication*, as hath heretofore been commonly used, as shall appear by examples following.

The third work.

First, place your Dividend between two parallel lines, and your quotient at the right side of your Dividend, behind a crooked line, as before; then place your divisor next to the left hand of your dividend, behind a perpendicular line: and lastly, mark how many figures your Divisor hath, and in the room of those Figures place cyphers under the figures of your Dividend, so many as your Divisor hath Figures, as in the last example: which I will again repeat in this place, and work it by this kind of Division, making the proof of the work by *Addition* of the same Figures.

<i>Divisor.</i>	<i>Example.</i>	<i>Quotient.</i>
	<i>Dividend.</i>	
8976.	714920798064 (
	0000.	

First, I point to the first Cypher towards the

Division.

67

the left hand, and seek how oft I may have 8, the greatest figure in value of my Dividend, having respect to the other figures of my Divisor, to take them also as often out of the figures above, and I find I can have it but 7 times, which 7 I place in the Quotient, and by that 7 I multiply my Divisor 8976, saying first, 7 by 6 is 42, place the 2 under the lowest cypher towards the right hand, and carry 4: then 7 by 7 is 49, and 4 is 53: set 3 under the next place to the left hand, and carry 5: then 7 by 9 is 63, and 5 is 68, place the 8 in the next place, and carry 6. Lastly, 7 by 8 is 56, and 6 in mind makes 62, which place down in their places, and the totall is 62832, to be subtracted from 71492, and there will remain 8660, and the work will stand thus,

Example.

$$\begin{array}{r}
 8976 \overline{) 714920798064} \quad (7 \\
 \underline{62832} \\
 \text{COOCO}
 \end{array}$$

Secondly, I cancel the first cypher to the left hand and place one cypher more towards the right hand, under the 0, and then I point again to the first cypher, and see how oft I may have 8 in 86, I find 9 times, and placing

placing 9 in the quotient, by it I multiply 8976 my Divisor, placing the lowest figure in value, under the lowest cypher to the right hand, and the rest in order, and I find the product to be 80784; which taken from 86600, leaves 5816 remaining, and then your work will stand as in this:

Example.

581

86600

$$\begin{array}{r}
 8976 \overline{) 77492798064} \quad (79 \\
 \underline{80000} \\
 628324 \\
 8078
 \end{array}$$

Thirdly, I cancel my Divisor, or one cypher, and place one cypher more under 7, and then seek how oft I may have 8 in 58, which I find 6 times, and by it multiply my Divisor 8976 makes 53856, which taken from 58167, leaves 4311, and the work will stand as followeth,

Example.

43

581

86600

$$\begin{array}{r}
 8976 \overline{) 77492798064} \quad (796 \\
 \underline{80000} \\
 6283246 \\
 80785 \\
 538
 \end{array}$$

Fourthly,

Division.

69

Fourthly, I cancel one cypher, and place a cypher under 9, and then seek how oft I may have 8 in 43, which I find but 4 times, which I place in the quotient, and by it I multiply my Divisor 8976, makes 35904, when taken from 43119 leaves 7215.

Example.

$$\begin{array}{r}
 7 \\
 432 \\
 35111 \\
 888885 \\
 \hline
 8976 \overline{) 35904} \quad (7964 \\
 \underline{1111000} \\
 62832464 \\
 807850 \\
 5389 \\
 35
 \end{array}$$

Fifthly, I cancel one cypher, and place a cypher under 8, and seek how oft 8 is in 72; I find 8 times, which placed in the quotient, I multiply my Divisor 8976 by it makes 71808, which taken from 72158, leaves 350, and the work stands as in the example following,

Example

Example. $8976 \overline{) 798064} (796480$
 $\begin{array}{r} 866666 \\ 2127 \end{array}$

628324648

8078500

53898

351

17

Sixthly, I cancel one cypher, and place another under the 0, and seeing I find I cannot have 8 in 3; therefore I place a 0 in the quotient. Seventhly, I cancel one cypher, and place one other under the 6, and seek how oft I may have 8 in 35; I find but 3 times, and placing 3 in the quotient, by it I multiply 8976, makes 26928, which taken from 35006, leaves remaining 8078.

Lastly, I cancel the next cypher; and do place another under the last figure of my Dividend 4, and seek how oft I may have 8 in 80. I find 9 times, and then placing 9 in the quotient, I multiply my Divisor 8976, and the quotient is 80784, equal unto the numbers above; and so being substracted from the numbers above, leave 0 remaining,

ing, and
thus.

Example

The p

The
Addi
Divid
Divid
thery
work
your
into
ces,

Division.

71

ing, and the work is ended, and will stand thus.

Example.

$$\begin{array}{r} 43238 \\ 7811150 \\ 8888818070 \end{array}$$

$$\begin{array}{r} 8976714920798864 \end{array}$$

$$\begin{array}{r} 628324648284 \\ 8078500978 \\ 5389860 \\ 351281 \\ 7 \end{array}$$

The proof 714920798864

The proof of this division is made by Addition of the Figures under the line or Dividend ; for if they return your former Dividend, the work is true wrought ; or otherwise be sure some error is in your work ; if there remains any fraction after your work is ended, then it is to be added into the lower figures in their several places, as shall appear by examples following.

Example.

12

Division.

Example.

111
 11746
 1461154111

Divisor.

The quotient.

1798 | 1439819896794 (800789709

14383

12586

14384

16182

12586

16882

The proof. 1439819896794 by Addition.

Here in this example working according to this latter form of work, there is advantage to be taken; if the figures of the quotient be well noted, as here the fourth figure of the quotient is 7, the product of the Divisor multiplied by it, is 12586, and also the seventh figure of the quotient is 7, so that coming to multiply the Divisor again by that 7, I need but take the product of the first multiplication by 7, which is 12586, and so place them in their several places, as in the example, and so likewise there is 8 in the quotient two times, to that for

for the
prod
multiplic
any o
more
will

The

Division.

73

for the latter Multiplication, I take the first product, 14384, and save that labour of multiplication of the Divisor by 8, and so of any other figure coming into the quotient more times than once, as by the examples will appear.

Example.

778

48889

4244628

158268737

7583 | 876593204 (115599

| 8888 8888 CO

7583

7583

37915

37915

68247

68247

The

876593204

Proof.

Example.

356 | 7856792 (22069

| 8888000

7122064

71130

232

785656702

E

How

How to divide by a Unite with Cyphers.

If you will divide by 10, or by 100, or 1000, or with any other Unite with Cyphers one or more; do but cut off so many figures from the right hand of your Dividend as there are cyphers in your Divisor, and the remains is your quotient.

Example.

If you will divide 786589 by 10, cut off the last figure 9, and the residue is your quotient 78658 $\frac{9}{10}$; or if you will divide by 100 cut off 2 figures, and the quotient will be 7865 $\frac{89}{100}$; or by 1000, and the quotient will be 786 $\frac{589}{1000}$; and so of all other.

<i>First.</i>	<i>Second.</i>	<i>Third.</i>	
78658	9	7865	89
10	100	100	0
67858 $\frac{9}{10}$	7865 $\frac{89}{100}$	786 $\frac{589}{1000}$	

If you will divide the product of 1999 squared; that is to say, multiplied in it self, which is 3996001 by 1999, for expedition of work. after you have found the first figure of the quotient 1, and taken that out, I find the next figure will be 9, which taken out, the third and fourth figures are also found to be 9, and so you need not make multiplication for every severall 9, but the first

Division.

75

first will serve for all, as in the example following.

Example.

$$\begin{array}{r} 1999 \overline{) 3998888} \\ \underline{3998888} \\ 0000000 \end{array}$$

1999 III

179999

000 1799 000

000 17

The proof of 3696001 this work.

Example.

$$\begin{array}{r} 89 \overline{) 8899} \\ \underline{8899} \\ 0000 \end{array}$$

89999 IIIII

89999922

899999

8999

89

9999800001

The proof.

E

Erie

*Brief Rules by Multiplication
and Addition.*

If you multiply any number of nines : as if you will multiply, or square 5 times 9 by 5 times 9, then place your nines in this order following.

Example.

$$\begin{array}{r}
 9999900000 \\
 \underline{99999} \\
 9999800001
 \end{array}$$

Then say, 9 times 9 is 81, place then 1 under the first 9 to the right hand, and then subtract the 1 from the first 9 to the left hand, and add the Cyphers between, and the product is ended, and is 9999800001, as appeareth.

The

Division.

Example.

856	856	856
24 $\frac{1}{2}$	24 $\frac{1}{2}$	24 $\frac{1}{2}$
3424	20544	20544
17128	285 $\frac{1}{2}$	214
42	203829 $\frac{1}{2}$	20758
20972		

What number is that which being divided by 24, the quotient will be 856? Answer, Multiply 856 by 24, makes 20544 for the number that you seek.

Example.

$$\begin{array}{r}
 856 \\
 \times 24 \\
 \hline
 3424 \\
 1712 \\
 \hline
 20544
 \end{array}$$

There is a plot of Land containing 848 Perches, the one side is 24, what must the other be? Answer, Divide 848 by 24, the quotient is 35 $\frac{1}{2}$ for the other side.

Division.

Division.

$$\begin{array}{r} 22 \\ 848 \overline{) 3581} \\ 244 \\ \hline 2 \end{array}$$

$$\begin{array}{r} 35\frac{1}{2} \\ 24 \\ \hline 140 \\ 708 \\ \hline 848 \end{array}$$

If you will divide the product of 5 times 9 squared, which is 9999800001 by 5 nines, then set the Divisor right underneath the Dividend, and add them together, and cut off the 5 cyphers from the product, and the residue is the quotient.

Example.

$$\begin{array}{r} 9999800001 \\ 99999 \\ \hline 9999999999 \\ 8000000000 \end{array}$$

The quotient.

What number is that, which being multiplied by 15, the total will be 756? Answ. Divide 756 by 15, and the quotient is 60 $\frac{2}{3}$ or $\frac{2}{3}$ for the answer, or number you do seek.

E 4

Example.

Division.

Example.

$$\begin{array}{r}
 50\frac{2}{3} \\
 15 \overline{) 756} \\
 \underline{250} \\
 506 \\
 \underline{756}
 \end{array}$$

There are 825 men, to march 15 in one rank, how many Files will they make? Divide 825 by 15, it makes 55 Files.

Example

$$\begin{array}{r}
 55 \\
 15 \overline{) 825} \\
 \underline{275} \\
 55 \\
 \underline{825}
 \end{array}$$

There is 948 pounds of powder to be employed in an assault of battery with 6 pieces of Ordnance; the first piece shooteth 4 pound, the second 5, the third 6, the fourth seven, the fifth eight, the sixth ten pound: the question is, how many shots each piece may make to make an equal number of shots? Answer, first, find how many pounds of powder all those pieces of Ordnance do spend, in making each of them one shot: which

Division.

81

which by adding together the number of pounds that each several piece spendeth, will be found to be 40: Then divide 948 by 40, and it makes 23 shots, and there will remain 28 pounds.

Example.

4			23
5	22	<i>Shots.</i>	40
6	948	(23	<hr/>
7	448		920
8			28
10			<hr/>
<hr/>			948
40			

E 5

THE



THE RULE OF REDUCTION.

TO reduce any great number into a smaller denomination, it is done by multiplication, and to reduce small denominations into greater, it is done by division, in this manner: mark how many of the smaller denominations is contained in one of the next greater, and by that number you must multiply the greater; or the contrary, if you would bring small denominations into greater, mark how many of the smaller denominations make one of the next greater, and that number shall be your Divisor.

Example.

If you would reduce pounds sterling into pence, multiply your pounds by 240 pence, because so many pence make a pound sterling, and the totall will be the number of pence in the sum of pounds given. And contrariwise, if you would bring pence into pounds sterling, divide your number of pence by 240 pence, which are the pence in one pound, and the quotient will shew the number

number of pounds in the sum of pence, given : but in this operation the Tables in the beginning of this book will help much for the speedy reducing of pounds, shillings, pence, yards, ells, bushels, pecks, pints, &c. into smaller or greater denominations : for if you search into the said Tables, you shall find your multiplier or divider, whereby you are to multiply or divide your number given, to perform the work, as shall appear by the several examples following.

Reduction of Cbyn.

In 87652 pound, how many pence? in the Table of Coin I find 240 pence makes one pound, so that in multiplying 87652 pounds by 240, makes the sum of pence desired.

1 Example.

87652

240

3506080

175304

21036480 d.

2 Example.

In 3790 pounds, 17 shillings 8 pence, how many shillings, pence and farthing?

3759

l.		9		
3759		598	l.	
20		72744	(3759	
		3649488		
75180		966666		
17		999		
75197	s.	9		
12		3		
		362	s.	d.
15C402		843	(17	32 (8.
75197		*88		*
		*		
902372	d.			
4				
36C9488	g. Prof.	l.	s.	d.
		3759	17	2

3 Example.

In 3785437289 farthings how many pounds, shillings and pence? divide by 960 farthings, because 960 farthings make one pound sterling; and the remainder is farthings, which divided by 48, the farthings in one shilling, make 3943163 pounds, 16 shillings 10 pence $\frac{1}{2}$.

Example.

Example.

431638			li
98208168			(3943163
3784437289			20
98866688			
999999			
q.			
4.			
321 s.	d.		78863276 s.
889 (16	10 $\frac{1}{4}$		12
488			
#			
			157726562
			78863276
			946359322 pence.
			4
The proof.			3785437289

How to bring pounds, shillings and pence
at the first work by Division.

To bring pence at the first work into pounds, shillings, and pence: add a 0 to your number of pence, and divide that sum by 240, makes pounds, and the last figure will be primes, every unite in value 2 shillings and the remainder always lesse than 24 pence, or one prime.

Example.

Example.

In 902372 pence, how many pounds, shillings, and pence? add a 0, makes 9023720 which divided by 240 pence, makes, &c.

9023720	2 d.	20 d.		
842216			l.	s.
6023720			(3759 8 or	17
2444448				8
2222			l.	s. d.
3759			17	8

2 Example.

In 75000837504 pence, how many pounds, shillings and pence? Add a cypher, or 0.

75000837504				
3820111340			l.	s.
75000837504			(31250489	6
2444444444				
2222222222				

How to bring farthings into pounds, shillings, and pence at the first work.

To bring farthings into pounds, shillings, and pence at one work; add a 0 to your number of farthings, and divide the sum by 960, the number of farthings in one pound sterling, makes pounds; and the last figure

figure of your quotient will be primes, every one in value two shillings: and if there remain 48, it is one shilling, or take 48 from the remainder for one shilling, the rest are farthings less than 48.

Example.

	l.	s.	d.	q.	
In	756	13	2	2	how many farthings?
		20			
<hr/>					
	15133	s.			
		12			
<hr/>					
	181598	d.			
		4			
<hr/>					
	726394	q.			

Total is 756 12 58 or 1 2 1

In 3785437248 farthings, how many pounds, shillings and pence? Add a 0, and divide by 960, makes 2943163 pounds, 8 primes or 16 shillings, 0 pence.

4378370	
960000000	
37854372480	(3943163 8
96000000000	
9999999	

How

How to bring pence, into pounds, shillings and pence another way?

Divide your number of pence by 4, and the remainder is pence, then the quotient by 6, and the remainder is groats alwayes less than 6 groats, or one prime, or 2 shillings, and the latter quotient, cutting off your primes, is pounds, and so you have pounds, shillings and pence.

Example.

In 785697 pence, how many pounds, shillings and pence? it makes 3273 pound, 4 shillings 9 pence.

3273	l.	4	s.	9	d.
785697		(29624		(3273	7
444444		6666			

If you will bring Farthings into pounds, shillings, and pence: Divide first by 16, and the remainder is farthings, alwayes less than 16, or one groat, and then again by 6, makes pounds, shillings, and pence, as before, cutting off the prime line.

Example.

In
shilling

8

In
12
pound
man

Reduction.

89

Example.

In 8735672 farthings, how many pounds shillings and pence?

Farthings.

2 8

Groats.

91258

833

l.

8735672

(848979

906916

1888888

88888

88888

The total is 9099 l. 13s. 2d.

Reduction of weight.

In 8756 hundreds 3 quarters, 24 pounds 12 ounces Averdupois, 16 ounces to the pound, and 112 pound to the hundred, how many pounds and ounces?

Example.

C. quart. l. Ounces.

8756

3

24

12

112

11

168

980780

17512

16

87568

87560

5884680

I

980780

12

680780 pounds.

Ounces 15692492

In

Reduction.

91

Example.

2356	24	Per. rood.
160	884	acres 2
<hr/>	377107 (2356	47 (3
141360	88888	48
235647	44	
I		
<hr/>		
377107		

Acres Roods Perches.

The proof. 2356 08 27

In 765437 Perches, how many Acres, Roods, and Perches ? divide by 160.

Example.

24	Acres 3	roods	Perches
2356	(4783	47	37
884	88		
8888			
44			

Reduction.

Reduction of time.

In 356 years, 24 days, 36 hours, and 22 minutes, how many days, hours, and minutes?

Example.

356

365

 1780

21364

106822

 129964 days.

24

 519856

2599286

 3

 3119172 Hours.

60

 187150320

22 Minutes.

 Total of all 187150342 Minutes.

The

Reduction.

93

The proof.

In 187150342 minutes, how many hours, days, years and minutes?

Example.

Minutes.	Hours.	Days.
187150342	2222	
187150342	733736	
66666666	(3129172	(129964
	222222	
	Days.	
	222	
	2042	
	129964	Years.
	36111	(356
	366	

	Years.	Days.	Hours.	Minutes.
The proof is	356	24	36	22

Reduction of Motion.

In 11 Signes, 34 Degrees, 25 minutes, 36 seconds, 24 thirds, how many fourths?

Example

Sign. Degr. Min. Sec. Thirds.

II 34 25 36 24

II

Sign.

30

364 Degr.

60

330

Degr.

34

21840 Min

25

364

Minutes.

21865

60

Seconds.

1311900

36

Seconds.

1311936.

60

78716160

24

Thirds.

78716184

60

Fourths.

4722971040

Product total.

The proof.

In 4722971040 fourths, how many signes, degrees, minutes, seconds, thirds, and fourths?

Example.

Reduction.

99

Example.

Fourths,

Thirds,

Seconds.

8403182

1 18232

(1311936

4722971840

(78718184

8888888888

88888888

Seconds.

Minutes.

Degrees.

183338

322

(364

1811838

(21888

88888888

888

Degr. Sign. Degr. Minut. Seconds. Thirds.

364

(12

4

25

56

24.

310

The proof.

Questions by Reduction.

I Question.

In 389 pounds sterling, how many Dollars of 4 shillings 8 pence, or 14 groats a piece? Reduce 389 pounds into groats, in multiplying them by 60, makes 23340 groats: which divide by 14 groats, make 1667 Dollars and 8 pence.

Example.

l.		s.	d.
389	9992	l.	
60	23340	(1667	0
	24444		8
	222		
23340			

2 Question.

In 300 pounds sterling, how many angels at 11 shillings a piece. Reduce 300 li. into shillings, makes 6000 shillings; which divide by 11 makes 545 angels, and there will remain 5 shillings.

Example.

l.		angel.	s.
300	3300	(545	
20	6000	5.	Rest.
	2222		
6000	55		

3 Question.

In 3012 pounds, how many Ryals of plate at 7 pence a Ryal. Reduce 3012 li. into pence, makes 722880 pence; which divided by 7, makes as in the example.

Example

Reduction.

97

Example.

l.
3012

240

Pence.

1484

Ryals.

d.

120480

122880

(103268

4

6324

111111

pence.

4 Question.

If one Dollar be worth 4 shillings 8 d. how many Dollars is in 108579 pounds, 16 shillings sterling? Multiply your pounds by 60, makes 6514740; then reduce 16 s. into groats by 3, makes 48 groats; which added into one total, makes 6514788, which divided by 14, makes as in the Example.

Example.

Pounds.

108579

60

Shillings.

16

3

6514740

48

48

groats. 6514788

970520

Dollars.

8514788

(465342

1111111

11111

F

In

In 4653342 Dollars of 14 groats a piece, how much sterling money? Multiply your Dollars by 14, makes 6514788 groats, which divide by 60, makes 108579 pounds sixteen shillings.

Example.

4653342	14	Groat			
18613368	3	444	l.	s.	
4653342	88888888	(1085779	16		
65146788					

5 Question.

If I receive 8060 French Crowns at six shillings a piece in France, how much sterling must I pay for them at 6 shillings one penny a piece? Multiply 8060 by 73 pence, the number of pence in one French crown, makes 588380 pence; which divided by 240 pence, makes 2451 pound, 11 shillings 8 pence.

Example.

Reduction.

99

Example.

$$\begin{array}{r}
 8060 \\
 73 \\
 \hline
 24180 \\
 56420 \\
 \hline
 588380
 \end{array}$$

Pound.

(2451)

Pence.

$$\begin{array}{r}
 28 \\
 148 \\
 122 \\
 1
 \end{array}$$

s. d.

(11 8)

6 Question.

If 564 yards of cloth cost 124 pound 12 shillings, how may I sell a yard to gain 22 pounds seven shillings by the whole sum? Answer, Add 22 pounds 7 shillings to 124 pounds 12 shillings, makes 146 pounds 19 shillings: which reduced into pence, makes 35268 pence; which divided by 564 makes 5 s. 2 d. $\frac{16}{147}$ of a farthing, for the price to sell one yard for to gain 22 pound 7 shillings by the bargain.

F 2

Exam-

100

Reduction.

Example.

		l.	s.
		146	61
		20	
		<hr/>	
l.	s.	2939	
124	12	12	
22	7	<hr/>	
<hr/>		5878	
146	19	2939	
		<hr/>	
		35268	

$$\begin{array}{r}
 3 \\
 80 \\
 2020 \quad d. \\
 35268 \quad (62 \frac{100}{80} \\
 5844 \\
 58
 \end{array}$$

7 Question.

If 156 ells of cloth cost 124 pounds, what will 1 ell cost? Reduce 124 pounds into shillings, make 2480 shillings; which divided by 156, makes 15 shillings 4 pence, $\frac{20}{156}$ farthings.

Example.

$$\begin{array}{r}
 124 \quad 624 \quad s. \\
 20 \quad 2480 \quad (15 \frac{140}{156} \text{ of a shilling.} \\
 \hline
 2480 \quad 2566 \\
 \quad 58
 \end{array}$$

8 Question.

Reduction.

161

8 *Question.*

If I sell 342 yards of velvet for 241 pounds, 17 shillings, how do I sell one yard? Reduce your 241 pounds 17 shillings into shillings, makes 4837 shilling, which divided by 342 yards, makes 14 shillings 1 penny, $\frac{4}{7}$, of a penny.

Example.

l.	s.			49
241	17	4		12
20		342		
<hr/>		4837	(14 $\frac{4}{7}$	98
4837		342		49
		34		
				588
249	d.		s.	d.
588	(1 $\frac{4}{7}$ of a penny,		14	1 $\frac{4}{7}$ d.
342				

9 *Question.*

A certain Noble man sent his servant to the Tower of *London*, with the Kings Majesties Warrant to the Mint-master for 3408 *li.* 15 shillings, willing him to bring it in pieces of 12d. of 9d. of 6l. of 3d. of 2d. of 1d. of ob. commanding him to bring him of each sort a like quantity, or number of pieces; the question is, to know how many of each sort he shall bring unto his master to make the said sum of 3408 *li.* 15s. Reduce

F 3

year

your money into half pence, and also your
several pieces of coyn into half-pence, and
divide the greater by the lesser, as in the
example.

Example.

l.	s.
3408	15
20	
<hr/>	
68175	
24	
<hr/>	
272700	
136350	
<hr/>	
1656200	

22	
29846	pieces
3838220	(24420 $\frac{64}{87}$)
677777	
6688	

12 d.	
9	
6	
3	
2	
1 ob.	
<hr/>	
67	

What

What Progression Arithmetical is, and the Rule.

Progression Arithmetical is nothing else but a brief summoning collecting or gathering together of divers numbers, increasing by equal proportion, into one total sum. As for example: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, &c. or 3, 4, 5, 6, 7, &c. or 2, 4, 6, 8, 10, 12, &c. or else by 3, as 5, 8, 11, 14, 17, 20, 23, 26, &c. or of all such like kinds of Progression, which do encrease equally by 2, 3, 4, 5, or 6, or any other greater increase, and such kind of Progression is called *Arithmetical*.

To find the sum of a Progression.

Mark first how many several places there be in your progression, and note that down, then add the first number of the progression to the last: then multiply half those 2 numbers by the whole number of the places, or else half the number of the places by the whole number of the first and last term added into one sum, and both wayes will produce the total sum of that Progression.

F 4

Example.

Example.

There is a progression beginning at 4 and is continued unto 44, increasing by 4. First, set down the numbers of that progression, beginning at 4, and ending at 44.

Terms. 4. 8. 12. 16. 20. 24. 28. 32. 36. 40. 44.

Places. 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11.

Here the first Term is 4, and the last Term is 44, which added together, makes 48, the one half which is 24, multiplied by 11, the whole number of places makes 264 the total.

Example.

44		44
4		4
<hr/>		<hr/>
48	481	48
11	52	
<hr/>	<hr/>	<hr/>
48	240	24
43	24	11
<hr/>	<hr/>	<hr/>
528	264	24
<hr/>		<hr/>
264		24
<hr/>		<hr/>
		264
<hr/>		<hr/>

The first question.

A certain man gave to his daughter in marriage

marriage the first day of *January* 1 pound, and the second day 2 pound, the third day 3 pound, and so encreasing every day 1 pound untill 31 days were expired; the question is what he should receive in the whole sum. First, 31 days is the number of places: and 31 is the last payment; add the first term 1 to the last term 31, makes 32, which multiplied by 15 one half, which is half 31; or take 31 and half 32, and the product will be the total sum of his wives portion.

Example.

32		
15½	31	
480	16	
16	186	1.
469	31	makes 496 total.
	469	

How to find the latter term of a Progression.

If you would know the latter term of a Progression of 100 terms increasing by 1, and beginning at ten; take one term from 100 terms, and there will remain 99, which multiply by 3, the excess or difference of the increase, makes 297; to the which if

F 5

add

add the first term 10, makes 307 for the 100 term of that progression.

2 Example.

100 terms.	99 terms.
1 Substrat.	3 excess.
99	297
	10 first term.

307

Or otherwise, take the excess 3 from the first term 10, and there will rest 7, which note apart, then multiply the number of places 100 by the excess 3, makes 300; to which add the 7, makes 307, as before.

Example.

10	100
3	3
7	307

Second question.

A certain Merchant bought 78 pieces of Exeter Kerfies, to pay 2 shillings for the first piece, four shillings for the second, six shillings for the third, 8 shillings for the fourth, and so forth, increasing his price unto 78 pieces, 2 shillings in every piece; the question is, what the Clothier had for his Kerfies?

First, find the latter term, taking one from

from 78, makes 77; which multiply by 2 makes 154, to which add the first term 2, makes 156 for the 78, or last term: then add 2 the first term to 156 the last, makes 158, which multiply by 39 half the number of places, make 6162 shillings for the sum of money the Clothier shall receive for his 78 Kerseys.

Example.

78		156
1		2
77		158
2		39
		1422
156 the last term		474
		6162 s.
		or 308 l. 2 s.

To find the number of terms.

There is a progression whose first term is 2, the last term 156, and the excess was 2, I would find the number of terms.

Subtract the first term from the last, and divide the remainder by the excess, the quotient is the number of terms wanting but one. Subtract 2 the first term, from 156 the last, leaves 154, which divided by 2, makes

makes 77, to which add 1, make 78, the number of terms.

$$\begin{array}{r} 156 \\ 2 \end{array}$$

$$156 \div 2 = 78$$

221 The number of terms

$$15$$

$$78$$

How to find the excessse or difference.

Substra \bar{c} t the first term from the last, and divide the remainder by one less than the number of the terms, and the quotient will be then the excessse or difference.

Example.

Substra \bar{c} t ten the first term, from 307 the last term, there will remain 297, which divide by 99, one lesse then the number of terms, which are 100, makes 3 the excessse.

$$\begin{array}{r} 307 \quad 100 \\ 10 \quad 297 \text{ (3 the excessse.)} \\ \hline 297 \\ 99 \end{array}$$

To find any middle term.

Substra \bar{c} t a unite from the number of the term you would know, and multiply the remainder by the difference, and to that product add the first term, and the total is the term you do seek.

Ex. m.

Example.

To find the 30 term in the last example of 100 terms, subtract 1, rests 29; which multiply by 3, the excess makes 87, to which add the first term 10, makes 97 for the 30 term of that progression.

Example.

30	1	10	11	40	21	70
1	2	13	12	43	22	73
	3	16	13	46	23	76
29	4	19	14	49	24	79
3	5	22	15	52	25	82
	6	25	16	55	26	85
87	7	28	17	58	27	88
10	8	31	18	61	28	91
	9	34	19	64	29	94
97	10	37	20	67	30	97

How to find what number shall begin and finish a Progression.

To the number of terms add one, which multiply be half the number of terms, and by the product divide the sum of the Progression, and the quotient will be the first term, and excess of that progression.

Example.

At 16 payments 353 pounds, 12 shillings is to be paid, the quest. is what number must begin and continue the progression.
First,

First, the money is 7072 shillings; then to 16, the number of terms, add 1, makes 17, which multiply by 8, half the number of term makes 136 for Divisor; by which divide 7072, and the quotient is 52 shillings for the first payment and excess, and by the same the other payments are found.

Example.

l.	s.		s.	
353	12	2		17
20		7072	(52	8
<hr/>		2368	<hr/>	
7072		23	136	

Example.

Nu		The proof.	Nu.	
52	1	1872	468	9
104	2		520	10
154	3		572	11
208	4		622	12
260	5	5200	676	13
312	6		728	14
364	7		780	15
416	8		832	16
<hr/>			<hr/>	
1872			5200	

Of

Of continual proportion, or Geometrical Progression.

TWO terms being given to find out a third in continual proportion.

Divide the **Q**uadrat, or square of the second term by the first term, and the quotient shall be the third proportional number or term sought for.

Example.

Let 8 and 12 be 2 terms given, unto which it is required to find a third term or continual proportion.

The quadrat or square of the second term 12 is 144; which being divided by the first term 8, the quotient will be 18 for the third proportional, or term required.

To find a mean proportional between any two numbers or extremes given.

Multiply the extremes given the one by the other: then extract the square root of the product for the mean proportional sought for.

Example.

Let 4 and 9 be the two numbers or extremes given, and let it be required to find a mean or middle proportional between them. Multiply 4 by 9, the product will be 36, the square root whereof is 6, which is the

the mean proportional between 4 and 9, the means given.

Between 2 and 54, let 2 mean proportionals be desired by the square of 2, which is 4; multiply 54, it makes 216, the Cube root whereof is 6 for the least of the two Means. Again, by 2 multiply 2916, which is the square of 54, makes 5832, of which the cube root is 18, for the greater mean proportional sought.

To find any middle Term, or any other Term in Geometrical Progression.

Increase your Progression by the excess, and the square of the term when you cease, or the number multiplyed in it self squarely, is the double of your term save 1, if the progression begin with an unite.

But if the first term be not an unite, then the square of any term is the double number of the said term; as if you would square the sixth term, then the ~~the~~ product should be the twelfth term, and so of any other term.

Example.

A Gentleman coming into a Market to buy a Horse, was asked 30 pounds for him? Nay (said that the Gentleman) his price is over great. Then said the owner (having more craft and subtilty then the Gentleman,

as commonly the old Proverb is true amongst Horse-courfers;) My Gelding hath four shooes upon his four feet (quoth he) you shall give me for the first nail (there being 28 in all) one farthing, and for the second nail 2 farthings, and for the third 4 farthings, and for the fourth 8 farthings; and so double at every nail you shall have him. Whereat the Gentleman smiled, saying, I will have him; and so they bargained, and then went to an Arithmetician to cast up the sum; but how this Gentleman was able to pay for his Horse, will appear by the work which I have put for an example; because I would not have any man ignorant in Arithmetick, to make any such blind matches without advice, as I know many have done to their cost.

Example.

Now according to the rule, I increase this progression unto the 7 Term thus, 1, 2, 4, 8, 16, 32, 64; which 64 I multiply by it self squarely, the product is 4096, which by the Rule is the 13 Term, which is 1 Term lesse then the double of 7; then multiply that 4096 by 2, it makes 8192, which is the 14 Term. Then multiply 8192 by 8192, and the product is 67108864, which is the 27 Term

114

Progression.

Term : the which being doubled, makes the Term 134217728.

Example.

$$\begin{array}{r}
 64 \\
 64 \\
 \hline
 256 \\
 384 \\
 \hline
 4096 \\
 2 \\
 \hline
 8190
 \end{array}$$

$$\begin{array}{r}
 8192 \\
 8192 \\
 \hline
 16384 \\
 73728 \\
 8192 \\
 \hline
 65536 \\
 \hline
 67108864 \\
 2 \\
 \hline
 134217728
 \end{array}$$

The extremes and excess of a Progression, given to find the sum.

Multiply the last term by the Excess, and from the Product abate the first Term, and divide the remainder by a Unite less then the Excess, and the quotient is the sum of the Progression desired.

Example.

In the last example the excess was 2, by which I multiply 134217728, and the product is 268435456, from which abate 1. the first term, and the remainder is 268435455; which

which should be divided by one unite less then the excess, which is two, and one less is but one ; therefore seeing one doth neither multiply nor divide, I conclude the price of the Horse to be 268435455 farthings, which I divide by 960, the farthings in one pound sterling, and the quotient is 279620 pound, 5 shillings, 3 pence 3 farthings, the price of the Horse, as in this example.

Example.

134217728

2

268435456

1 farthing.

268435455

Farthings.

~~268~~

78299283

l.

s.

288434444 (272620

2

988888888

999999

	l.	s.	d.	q.
Total	279620	5	3	3

I have inserted in the next page the triall of this work by increasing the Terms from 1 to 28, and also the addition of the total, which shews the answer to be true.

Example.

Example.

	1	1
	2	2
	4	3
	8	4
	16	5
	32	6
	64	7
	128	8
	256	9
	512	10
	1024	11
	2048	12
	4096	13
	8992	14
	16384	15
	32768	16
	65530	17
	121072	18
	262144	19
	524288	20
	1048576	21
	2097152	22
	4194304	23
	8388608	24
	16777216	25
	33554432	26
	67108864	27
	134217728	28
The total	268435455	1

Other.

Otherwise, subtract the first term from the last, and divide the remainder by one less then the Excess, and to the quotient add the last Term, and the totall is the sum.

Example.

To twelve men a sum of money is given, to the eldest $\frac{1}{2}$, to the second $\frac{1}{2}$, the remainder, and so to every one of the rest, and the last portion was found to be 4 pounds, and the last half being also 4 pounds, was given to a friend to see the money to be equally distributed; what was each mans portion, and the sum given?

Let four be the last portion, and twelfth Term, and so double until you come to the first Term, and you shall find every mans portion. Then by this second Rule, you shall find the total to be 16380 pounds, to which add the Executors part 4 pounds, makes 16384 pounds.

3 Example.

A Gentleman bought a Manor, with all the appurtenancies, for a sum of money unknown, but he was to pay at several dayes of payment, by continual triplation of every payment, from the first payment, which was four pound, and the last 8748 li. the question

question is what he paid for the said Manor and Lands.

Example.

Subtract the first term 4 from the last term 8748, there will remain 8744; which divide by the excess one less, viz. by 2, and the quotient will be 4372: to the which add the latter term 8748, and the total is 13120 pounds, for the sum which the said Manor and Lands cost.

$$\begin{array}{r}
 8748 \\
 \underline{4} \\
 8744
 \end{array}
 \qquad
 \begin{array}{r}
 8748 \\
 \underline{4372} \\
 13120
 \end{array}$$

Fractions.

YOU shall understand that in the work of Fractions, hereafter in the next page following, I have used another form of working then heretofore hath been used; as when you will set forth any fraction, as $\frac{1}{4}$ thus heretofore used, set them out thus, 3:4, or $\frac{7}{8}$, place thus, 7:8 with a double prick between them; and so of any other, as of $\frac{11}{16}$ of a pound, thus, 15:20 of one pound: or fractions of fractions thus, $\frac{2}{3}$ of $\frac{3}{4}$ of $\frac{1}{2}$ of a pound, set them thus, 2:3 of 3:4 of 5:6 of a pound: and

and so of all other fractions, as shall appear afterwards in the operations following; and so being placed, they are more apter and fitter for all the several operations of Arithmetick, then being placed after the ordinary form of working. And thus much I thought good to express for the better understanding of the Rules hereafter following in all fractional operations. And now I will proceed unto the several Rules of Fractions with their Examples.

How to reduce Fractions of Fractions.

The first Rule.

Multiply their Numerators one into another for a new Numerator, and likewise their Denominators for a new Denominator, and the work is ended.

Example.

If you would reduce $3:4$ of $2:3$ of $7:8$ of one pound sterling; multiply 3 by 2 makes 6, and then 6 by 7 makes 42 for the new Numerator to your fraction; then 4 by 3 makes, 12; and 12 by 8 makes 96 for a new Denominator, and the fraction is $42:96$ of a pound.

$3:4$ of $2:3$ of $7:8$ of 1, makes $42:96$ of a l.

2 Example.

2 Example.

Again 3.5 of 9:8 of 7:10 of 11:12 of a pound, makes 2079:4800.

3	
9	
27	
7	
189	
11	
189	
189	
2079	

8
5
40
10
400
12
4800

3 Example.

What is 1:2 of 2:3 of 3:4 of 4:5 of 5:6 of 6:7 of one pound? Answer, crosse all them by, as equal terms, and set the unequal terms 1:7 of a pound for the total sum; but after the other form of work, it would have brought out 720:5040 of a pound, which by abbreviation makese 1:7.

The proof.

72:504, 36:252, 18:126, 9:63, 3:21, 1:7.

Rule.

2 Rule. *How to reduce Fractions of Integers.*

Multiply all the Denominators of your several fractions, for the new or common Denominator to all your given fractions.

Then to find new Numerators to each of your given fractions, multiply each fractions numerator into the Denominators of each several fraction, excepting his own Denominator, for the new numerators, as in this example,

Example.

If you would reduce 3:4 and 5:6 and 7:8 of a pound into one Denomination; multiply all the Denominators together, saying 4 by 6 makes 24, and 24 by 8 makes 192 for the common Denominator to all the given Fractions.

Then multiply 3, the Numerator of the first fraction, by 6, the Denominator of the second fraction makes 18, and 18 by 8 makes 144 for his Numerator.

Secondly, multiply 5, the Numerator of the second fraction by 4 and 8, the Denominators of the other two fractions, makes 160 for the new Numerator of the second fraction.

Thirdly, multiply 7 the Numerator of the third fraction, by 6 and 4, makes 168.

G

Example.

122

Fractions

Example.

N.D.	18	20	42	144
144 3:4	8	8	4	160
160 5:6	—	—	—	168
168 7:8	144	160	168	—
—	—	—	—	192

192

The total, 472: 192

2 Example

If you would reduce 2, 3, and 3:5, and 8:9 of a pound,

N.D.		N.D.
90 2:3		7:10 1365
81 3:5	Also,	10:15 1360
120 8:6		11:13 1610
—		—
135		1950

3 Example.

If you would reduce 7:8, 1:3, 4. 5, and 6:7 of a pound.

N.D.	
2205 7:8	
840 1:3 40	1:2 40
1680 2:3 70	7:8 70
2016 4:5 48	3:5 48
2160 6:7	—
—	80 158
2520	

Hon

How to prove a Fraction by the known parts of Coyn.

In the first example of fractions of fractions, I find that 3:4 of 2:3 of 7:8 of a pound sterling to be 42:96 parts of a pound; for trial whereof take 7:8 of a pound, which is 17s. 6 d. or 210 pence, the 2:3 of that number is 140 pence; and 3:4 of 140 pence is 105 pence; now multiply 42 the Numerator of your fraction 240 d. and divide by 96 the Denominator, makes 105 pence, the proof as followeth.

4 Example.

s.d.			d.
17.6			
12.	258 (70		140
	33 2		70
34			35
176	140		105d
210			
42			
240			
680	48		
184	2588 (105 d.		
	988		
	99		
10080			

2 Example.

In the first example of Fractions of integers, there was 3:4, 5:6 and 7:8 of a pound, reduced into one Denominator, and the total by addition was 472:192 of a pound. Now for the proof of the work, multiply the numerator 472 by 240, makes 113280; which divided by 192 the Denominator, makes 590 pence; which divided by 12 pence, makes 2 l. 9 s. 2 d. The proof of this trial in the parts of a pound, take first for 3:4 of a pound, or 15 shillings; then 5:6 of a pound is 16 s. 8 d. also 7:8 of a pound 17 s. 6 d. and the total added together, is 2 li. 9 s. 2 d. which proves the work to be true.

Example.

$$\begin{array}{r}
 472 \\
 240 \\
 \hline
 18880 \\
 944 \\
 \hline
 113280
 \end{array}$$

$$\begin{array}{r}
 472 \times 240 \\
 113280 \text{ (590)} \\
 192 \times 240 \\
 46080 \\
 \hline
 159360
 \end{array}$$

d.			15. 0
112	3. 1	d.	16. 8
590	(49	2.	17. 6
222			
3		2.	9. 2.

3 Rule

3 Rule. Addition in Fractions.

If your fractions be of one Denomination, then add all your numerators together, subscribing the common Denominator under the line.

Example.

2:4	3:12	32:8
5:4	8:12	17:8
3:4	11:12	13:8
7:4		
17:4	22:12	62:8

The Second Rule

If your Fractions be not of one Denomination, then reduce them by the second rule of Reduction to one Denomination, and then add them into one sum, subscribing under the common Denominator.

Example.

40	2:3	1440	24:12
45	3:4	836	13:10
38	4:5	2040	17:6
133	60	4316	72 0

If you would add 40. 80, 30. 200, and 50. 90, cut off a cypher from each Numerator and Denominator, and the Fractions remain

G 3

maining will be of the same with the given fractions, and then work as before.

Example.

720	4:8	48	30:40
216	3:20	192	60:20
800	5:9	56	70:80
<hr/>		<hr/>	
1736	1440	296	64
<hr/>		<hr/>	

The proof of Addition by parts of Coyn.

In the second example, 2:3, 3:4, and 4:5 of a pound, are found to be 133:60, therefore divide 133 by 60 makes 2 *li.* and 13:60 or 13 groats remaining, which is 2 pound 4 shillings, 4 pence.

The proof, add 2:3 of a pound, which is 13 shillings 4 pence, and 3:4 of a pound, which is 15 shillings, and 4:5 of a pound, which is 16 shillings, into one total, makes 2 pound 4 shillings 4 pence, as before.

Example.

Groat.				s.	d.
1	l.	s.	d.	13	4
233	(2	4	4	15	0
68				16	0
				<hr/>	
				2	4
					4
				4. Rule	

4 Rule. *Subtraction in Fractions.*

As before in *Addition*, so also in *Subtraction*, reduce your fractions to one common denominator, then subtract the smaller numerator from the greater, and subscribe the common denominator under the remainder.

1 Example.

If you will subtract $3:4$ from $7:4$, there will remain $4:4$, or one Integer.

Also $7:12$ from $13:12$, leaves $6:12$, or $1:2$ remaining. But if you will subtract $2:3$ from $7:8$, then reduce them to one denomination by the second Rule of *Reduction* and work as in this example.

Example.

$3:4$	$7:12$	16	$2:3$
$4:4$	$13:12$	21	$7:8$
<hr/>			
$4:4$	$6:12$		$5:24$

2 Example.

Again $3:8$ from $15:16$, leaves $72:128$ remains

120	$15:16$
48	$3:8$
<hr/>	
72	128
<hr/>	
	$G. 4.$

The

*The proof of Subtraction by the parts
of Coyn.*

In the example before, where I take 2:3 from 7:8, the remainder was 5:24 of a pound which is five times ten pence, or 4 shillings 2 pence. Also for proof take 13 s. 4 d. which is 2:3 of a pound, from 7:8, which is 17 s. 6 d. there will remain 4 s. 2 d. as before.

5 Rule. Multiplication in Fractions.

Multiply Numerator by Numerator, and Denominator by Denominator, to make the new Numerator, and new Denominator, and the work is ended.

1 Example.

If you will multiply 2:3 by 3:4, the product of that multiplication will be 6:12, or 1:2.

6	15	2520
2:3	5:7	35:60
3:4	3:4	72:120
12	28	7200 or 252:720

*The proof of Multiplication by the parts
of Coyn.*

In the first example 2:3 is multiplied by 3:4, and the product makes 6:12 of a pound
or

of ten shillings : for proof whereof multiply 13 shillings 4 pence, or 160 pence, which is 2.3 of a pound, by 15 shillings, or 180 pence, which is 3.4 of a pound and the product will be 28800, which being divided by 240 pence, the pence in one £ will yield in the quotient 120 pence, or ten shillings.

Example.

s.	d.		
13	4	15	180
12		12	160
<hr/>		<hr/>	
26		30	10800
134		15	180
<hr/>		<hr/>	
160		110	28800
<hr/>		<hr/>	

s.	d.	s.
28800	(120	228 (10
24440		222
22		2

6 Rule. Division in Fractions.

Multiply the Numerator of the Dividend by the Denominator of the Divisor for a new Numerator ; and secondly, the Denominator of the dividend by the Numerator of the divisor, for a new Denominator, and the division is ended ; otherwise, place your dividend first above, and the divisor underneath

underneath, after any manner, and multiply cross, and place them as in these examples.

If you will divide 6:12 by 2:3, which was the product of 2:3 by 3:4 in the last example, then it will bring out 18:24, or 3:4, the other number, which proves the work good.

Example.

18	13	360
8: 12	2: 3	12: 18
2: 3	3: 4	16: 24
24	12	240

If the Denominators of the Fractions be both alike, then divide their Numerators one by another; as 27:32 divided by 3:31, makes the quotient to be 9:32.

Example.

9	3	3
27: 32	9: 8	21: 12
3: 32	3: 8	7: 12
32	8	1: 2

If the Numerators be alike, then set the denominator of the Divisor above the denominator of the Dividend, as 3:4 by 3:8 makes the quotient 8:4, or two integers, and contrariwise 3:8 by 3:4, makes the quotient 4:8, or 1:2.

Example.

Example.

8	4	24
3 : 4	3 : 8	7 : 16
3 : 8	3 : 4	7 : 24
4	8	16

The proof of Division by the parts of coyn.

In the second of the first example, where I divide 2.3 by 4.5, the quotient is 10.12, which in coyn is 16 shillings 8 pence: for proof I do multiply 2.3 of a pound, which is 163 pence, by 24 makes 38400; which divide by 4.5, or 192 pence, makes 200 pence, which is sixteen shillings 8 pences the proof.

Example.

	s.	d.		s.	
2.3	13	4	4 5	16	160
	12			12	240
	<hr/>				6400
	160			192	320

d.
38400 (200
19200
192
2

d.
88
200 (16 8
192
8

7 Rule.

7 Rule. *How to work whole numbers with Fractions.*

If you will add, substract, multiply, or divide whole numbers with fractions, set the whole numbers fraction-wise, and put 1 after the Denominator, and then work as in the Rules before, as if they were all fractions, and no whole numbers.

Example.

If you will add 33:1 with 13:4, multiply the Numerator 33 of your whole number, by the Denominator of your Fraction 4, makes 132:4, which add unto 13:4, makes the total 145:4.

132	33:1	396	128:1
Ad 13	15:4	36	36:7
145 : 4		932 : 7	

2 Example.

If you will substract 13:4 from 33:1, reduce them, and substract 13 from 132, rest 1194.

132	33:1	896	128:1
Sub. 13	13:4	36	36:7
119 : 4		860 : 7	

3 Example.

Example.

If you will multiply 33:1 by 13:4; multiply the Numerators, 33 by 13, makes 429 to the which subscribe the Denominator 4, makes 429.4.

33:1	128:1
13:4	36:7
429.4	4608.7

2 Example.

If you will divide 33:1 by 13:4, multiply crosse 33 by 4, makes 132 to be set above; then 13 by 1 makes 13 for Denominator.

132	108	896
33:4	27:1	128:1
13:4	32:4	36:7
13	32	36

8 Rule. How to work whole numbers and Fractions with Fractions.

Reduce your whole numbers into Fractions, in multiplying your whole number by the Denominator of your Fractions, and to that product add the Numerator of your Fractions, and subscribe the old denominator.

1 Example.

If you will multiply 283:4 by 3:5, reduce

28

28 $3\frac{4}{5}$ into fourths, in multiplying by the Fractions Denominator 4, saying 28 by 4 makes 112, to the which add the Numerator of your fraction 3, makes 115; which multiplied by 3.5, makes 345.20.

$$\begin{array}{r} 28 \\ \times 4 \\ \hline 112 \end{array} \quad \begin{array}{r} 3 \\ \times 4 \\ \hline 12 \end{array} \quad \begin{array}{r} 115.4 \\ \times 3.5 \\ \hline 345.20 \end{array}$$

If you will divide 28 $3\frac{4}{5}$ by 3.5, reduce them as before, and then multiply them cross, makes 115.4 by 3.5, is 575.12.

Example.

$$\begin{array}{r} 575 \\ \times 3.5 \\ \hline 12 \end{array}$$

3 Rule. *How to abbreviate a Fraction.*

Take one half of the Numerator, and 1.2 of the Denominator as oft as you may, until the lowest numbers in value of your Fractions comes to be primes together; which are such numbers, as cannot be abbreviated no lower.

Example.

Example.

In the first example of Fractions of Fractions, the fraction was 71.504 , which was abbreviated unto 1.7 of a pound? First, take half the Numerator 72 , which is 36 , then half the Denominator 304 , which is 252 ; then 1.2 of 36 is 18 ; and 1.2 of 252 is 63 ; then I see I cannot take 1.2 of the remainder, wherefore I see I may abbreviate them by 3 still, saying, the third part of 9 is 3 , and 1.3 of 63 is 21 ; lastly, 1.3 of 3 is 1 , and 1.3 of 21 is 7 , which place thus, 1.7 , so that I find by abbreviation that 72.504 of a pound is one seventh part of a pound.

Example.

$72.504 \quad 36.252 \quad 18.126 \quad 9.63 \quad 3.21 \quad 1.7$

If you cannot take half the numbers, then mark whether they will abbreviate by 3.4 or 5 , or any other number under 9 . as for example, I would abbreviate 92.144 . I see I may abbreviate both by 4 , then taking 92 , divide by 4 , makes 23 , and 144 by 4 , makes 36 , total 23.3 , &c.

If you will abbreviate 375.625 of a pound you may easily see they will be both abbreviated by 5 , wherefore divide the Numerator and Denominator both by 5 , as oft as you

can, untill they become primes together, and you shall find the value of that Fraction to be 3. 5 of one pound, or 12 shillings.

Example.

$$\begin{array}{cccc} 2 & 3 & 2 & \\ 375(75 & 625(125 & 75(15 & 425(25 \ 3.5 \\ 55 & 555 & 55 & 55 \end{array}$$

10 Rule. How to find the value of any Fractions.

Multiply the Numerator of your Fraction by the parts contained in the whole, and divide that product by the old Denominator, and the Quotient will be the value of that Fraction in the known parts of Coyn.

Example.

If you would know what 24. 32 parts of a pound is in Coyn, multiply your Numerator 24 by 24, the pence in one pound, makes 5760; which divided by 32, the Denominator, makes 180 pence; or 15 s. the true value of that Fraction.

Example.

Example.

$$\begin{array}{r} 24 \\ 240 \\ \hline 960 \\ 48 \\ \hline \end{array}$$

$$\begin{array}{r} 28 \quad d. \\ 8188 \quad (180 \\ 3222 \\ 33 \end{array}$$

$$\begin{array}{r} 6 \quad s. \\ 188 \quad (15 \\ 122 \\ 2 \end{array}$$

5760

What is 343:522 parts of a yard? multiply 343 by 16, the number of nails in one yard, makes 5448; which divided by 522, makes 10 nails, and 268:522 parts of a nail.

Example.

$$\begin{array}{r} 343 \\ 16 \\ \hline 5488 \end{array}$$

$$\begin{array}{r} 26 \\ 5488 \\ 5222 \\ 52 \end{array}$$

$$\begin{array}{r} \text{Nails.} \\ (10 \quad 268:522 \end{array}$$

II Rule. How to change the Sirname of a Fraction.

Multiply the Numerator of your Fraction by the parts or new Sirname of that you would change your fraction into, and divide by your Denominator, and the quotient will be your desire.

1 Example.

I have 324:1620 parts of a year, which I would

would convert into days; I multiply 324 by 365, the number of days in one year, makes 118620; which divided by 1620, makes 73 days, the value of that fraction,

Example.

$$\begin{array}{r}
 324 \\
 365 \\
 \hline
 1620 \\
 1944 \\
 972 \\
 \hline
 118260
 \end{array}$$

$$\begin{array}{r}
 48\phi \text{ Days.} \\
 118260 (73 \\
 1622\phi \\
 18
 \end{array}$$

I would change 256:5292 parts of a pound into pence, multiply the Numerator 756 by 240 pence, makes 181440, which divide by the denominator 5292, and the quotient is 34 pence, 1512:5292,

Example.

$$\begin{array}{r}
 756 \\
 240 \\
 \hline
 30240 \\
 1512 \\
 \hline
 181440
 \end{array}$$

$$\begin{array}{r}
 151 \\
 22682 \text{ d.} \\
 181440 (341512:5292 \\
 12922 \\
 129
 \end{array}$$

12. Rule. Questions of Fractions.

What number is that to the which if you do

do add 3:4, the Total will be 5:6 of a pound? Answer, reduce them to one denomination, and they are for 3:4 of a pound 18:24, and the 5:6 are 20:24, from which subtract 18, rest 2:24 of a pound, or 20 pence. The proof, Take 3:4 of a pound, which is 15 shillings, and add 20 pence to it, and the total is 16 shillings 8 pence, which is 5:6 of a pound.

Example.

N.D	s.	
18 3:4	15	0
20 5:6	1	8
<hr/>		
2 24	16	8

2 Example.

What number is that from which if you do subtract 8. 12, the remainder will be 6 10? Answer, Reduce them, and add them both into one Total, makes 152:120 of a pound for the number you do seek.

The proof in coyn; 152:120 of a pound is 304 pence, and 8:12 of a pound, is 160 pence, which taken from 304, leaves 144 pence remaining, which is 6:10 of a pound, or 12 shillings, as appears by the work.

140

Fractions.

80	8.	12	152	304	2	
72	6.	12	2	160	222	(12
<hr/>						
152		120	304	144	2	

What number is that which being multiplied by 3:5, the Product will be 9:20? Answer, divide 9:20 by 3:5, and the quotient is 45:60, or 3:4. For the proof, multiply 108 pence, which is 9: 10 of a pound, by 240, the product is 25920; which divide by 144, or 3:5, which is twelve shillings, makes 180 pence, or 3:4 of a pound.

3 Example.

			108
45	2222	d.	240
9:20	28920	(180	<hr/>
3:5	22222		4320
60	222		216
	2		<hr/>
			25920

Example.

What number is that, which being divided by 7:8, the quotient will be 4:5? Answer Multiply 7:8 by 4:5, the product is 28:40, or 7:10, which makes 14 shillings.

The proof in Coyn 7:8, which is 210 pence, by 4:5, which is 192 pence, and the Product

Produ
makes
the ex

7:8 0

Product is 40320; which divided by 240, makes 168 pence, or 14 shillings? behold the example following.

Example.

s.	d.	s.	d.
7:8 or 17	6	4:5 or 16	
12		12	
<hr/>		<hr/>	
40		32	
<hr/>		16	
17		<hr/>	
210		92	
		<hr/>	
		192	
		210	
		<hr/>	
		1920	
		384	
		<hr/>	
		40320	

$\frac{168}{168} \times \frac{14}{14} = \frac{2352}{2352}$
 $\frac{168}{168} \times \frac{14}{14} = \frac{2352}{2352}$
 $\frac{168}{168} \times \frac{14}{14} = \frac{2352}{2352}$

Rule.

Rules of Practice.

Rules of Practice by the first Table.

TO work by the Aliquot parts of a pound, search in the first Table for your given price, and by that number found divide your number given, and the quotient is your answer in pounds, and the remainder is the fraction of one pound.

But if the given price be not found exactly at the first entrance, then find two or more numbers, to make the given price, and then work as followeth.

Example.

If one yard cost 3 s. 4 pence, what will 7859 yards cost at that rate. I enter the Table, and against three shillings 4 pence, I find 1.6 of a pound; wherefore I divide 7859 by 6, makes 1309 pound, 5.6 of one pound, or 16 shillings 8 pence.

7859	l.	s.	d.
1309	(1309	5.6 or 16.	8

The

The first table.

The second table.

The aliquot parts
of a pound.

Shillings.

s. d. par.	s. d. par.	s. par.	s. par.
1 240	1.4 15	1 $\frac{1}{2}$	11 5 $\frac{1}{2}$
2 120	1.8 12	2 $\frac{1}{6}$	120.
3 80	2.0 10	3 $1\frac{1}{2}$	136 $\frac{1}{2}$
4 60	2.6 8	4 2.	147.
5 48	3.4 6	5 2 $\frac{1}{2}$	157 $\frac{1}{2}$
6 40	4 0 5	6 3.	168.
8 30	5.0 4	7 3 $\frac{1}{2}$	178 $\frac{1}{2}$
10 24	6.8 3	8 4.	189.
1. 0 20	10.0 2	9 4 $\frac{1}{2}$	199 $\frac{1}{2}$
1. 3 16	20.0 1	10 5.	20 10

Divisors.

Multipliers.

At sixteen pence an ell, what will 8976
ells cost? I find for sixteen pence my Divi-
sor to be 15, and so dividing 8976 by 15, the
quotient is 598 pound, 6: 15, or 2:5, which
is 8 shillings.

Exam-

Example.

$\begin{array}{r} 8976 \\ 11 \overline{) 8976} \\ 88 \\ \hline 17 \\ 16 \\ \hline 1 \end{array}$ (598 6 : 15, or 2 : 5 is 8

$\begin{array}{r} 11 \\ 11 \end{array}$

$\begin{array}{r} 11 \\ 11 \end{array}$

Add a cypher to your number given, and the last figure of your quotient will be primes, every one in value two shillings, and the remainder is the fraction of a prime, always less then two shillings. In the first example, the remainder was 5 : 6 of one li. but if you add a cypher, the quotient will be 1309 pound, 8 primes, or 16 shillings, and the remainder is 2 : 6 of one prime, or 1 : 3, which is 8 pence.

$\begin{array}{r} 13098 \\ 8 \overline{) 13098} \\ 8 \\ \hline 509 \\ 40 \\ \hline 109 \\ 8 \\ \hline 29 \\ 24 \\ \hline 5 \end{array}$ (1309 8 1 : 3 or 16 8

At 2 shillings 6 pence a pound Pepper, what will 2436 pound cost? find 2 shillings, 6 pence 1 : 8 of a pound, wherefore add a cypher, and divide by 8, make 304 pound 10 shillings.

$\begin{array}{r} 304 \\ 8 \overline{) 2436} \\ 24 \\ \hline 36 \\ 32 \\ \hline 46 \\ 40 \\ \hline 66 \\ 64 \\ \hline 26 \\ 24 \\ \hline 26 \\ 24 \\ \hline 26 \end{array}$ (304 5 or 10

At

Rules of Practice.

145

At eight pence a pound Ginger, what will 77856 pound cost? Divide by 30. adding a cipher, makes 2595 pound, 2 primes, or four shillings.

$$\begin{array}{r} \text{xxx} \quad \text{l.} \quad | \quad \text{s.} \\ 77856x \quad (2595 \quad 2 \text{ or } 4 \\ 33333x \end{array}$$

At 7 pence a pound Sugar, what shall 23459 pound cost? For 12 pence divide by 20, makes 1172 pounds, 9 primes 1:2, or 19 shillings: then for the rest of your given price, which is 5 pence, take 48, and divide, and the quotient is 488 pounds, 7 primes, which added together into one sum, makes the total 1691 pounds, 13 shillings 7 d.

Example.

$$\begin{array}{r} \text{x x x} \quad \text{l.} \quad | \\ 23459x \quad (1172 \quad 9 \\ 22222x \end{array}$$

$$\begin{array}{r} \text{43x} \\ 42x4x \quad 3 \quad \text{l.} \quad | \\ 23459x \quad (488 \quad 7 \quad 7:14 \\ 4888x \end{array}$$

		<i>l.</i>	<i>s.</i>	<i>d.</i>
	1172	19	11	0
	488	14	7	
<i>The sum</i>	1661	13	7	

H

At

At 6 shillings 8 pence a pound Cloves, what will 3769 pound weight cost? Divide by 3, makes 1256 pounds, 3 primes 1 : 3, or 6 shillings 8 pence.

3333	l.	s.	d.
3769	(1256 3 1:3, or 6		8
33333			

At 22 pence an ell of Holland, what will 3768 ells cost? For 20 pence divide by 12, makes 314 pound, and for 2 pence by 120, makes 31 pound, 4 primes, or 8 shillings, the total is 345 pounds, 8 shillings.

28	l.	24	l.	s.
3768	(314	3768	(31	4
2222		2222		
22		22		

314	0
31	8

345	8
-----	---

If one ell of Holland cost 20 pence, how many ells shall I buy for 345 pound? multiply 345 by the price, which 1 : 12, or by 12

Rules of Practice.

147

12, makes 4140 ells, the sum desired

345 58 1.
12 4248 (345 The proof.

xxxx

690 11

345

4140

If one ell of Ozenbrigs cost 8 pence,
what sum of ells will 78 pounds buy me;
multiply by 30, makes 2340 ells.

78

30

2340 ells.

78

15

390

78

1170

xx ells.

xx78 (78

xx8

xi

At 15 pence an ell of Canvas, how many
ells will 100 pounds buy? multiply by 17,
makes 1600 ells.

If one ell of Parchment-lace cost one
penny, how many ells shall I have for 73.1.
multiply by 240, makes 17520 ells.

H 2

Ex

Example.

240		7	1.
73			
<hr style="border: 0.5px solid black;"/>			
720		27520	(73
1680		2448	
<hr style="border: 0.5px solid black;"/>		2	
17520			

If one acre of land be 5 shillings, how many acres may I have for 132 pound? Multiply by 4, makes 528 acres,

132

4

 528 Acres.

The Rule of Practice by the second Table.

If the price given be any number of shillings, search in the second Table for the price given, and by the number there found, multiply your number of yards, ells, pounds, or pieces, and cut off the last figure with a dash of the pen for primes, every one in value two shillings, and the product is the sum of pounds and shillings that your given number will cost.

Example.

At two shillings an ell of Holland, what will

will 956 ells cost? In the second Table I find the tenth of the number given, so that if you take the tenth of 956, it is 95 pounds 12 shillings, onely by cutting off the last figure with a dash of the pen.

946 Ells at 2 s. an ell, makes 95|6 or 12 s.

At 7 shillings an ell of Cambrick, what will 789 ells cost? Multiply by 3 1 : 2, or take half of the given number, and multiply the whole number given by 3, makes in one sum, cutting off the prime line, 276 pounds, 3 shillings.

Example.

789
3 1:2

2367

394

276| 1:2

Also 1240 ells at 7 s.

434 l.

3 1:2

3720

620

434|0

H 3

At

At 25 shillings a piece Raisins, what will 356 pieces cost? take always half the number of shillings of your given price for your multiplier, and work as before, and the Product is 456 pounds, 0 prime.

Example.

$$\begin{array}{r}
 356 \\
 12 \quad 1.2 \\
 \hline
 4272 \\
 178 \\
 \hline
 4450
 \end{array}$$

Also 75032 pieces at 26 s. a piece.

$$\begin{array}{r}
 75032 \\
 13 \\
 \hline
 225096 \\
 75032 \\
 \hline
 975416
 \end{array}$$

If one barrel of Soape cost 47 shillings, what will 3584 barrels cost? multiply by 23 1.2, makes 8422 pounds 8 shillings.

Example.

Example.

$$\begin{array}{r}
 3584 \\
 23 \quad 1.2 \\
 \hline
 10752 \\
 7168 \\
 1792 \\
 \hline
 8422 \overline{)4}
 \end{array}$$

At three pound fix shillings a Barrel, what will 124 cost ?

$$\begin{array}{r}
 124 \\
 33 \\
 \hline
 372 \\
 372 \\
 \hline
 409 \overline{)2}
 \end{array}$$

If one Acre of Land cost 6 pound 8 shillings, what will 758 Acres cost? Multiply by 64. shillings, which is half the price, the
H. 4. Pro-

Product 4851 pounds, 4 shillings, or two primes.

$$\begin{array}{r}
 758 \\
 64 \\
 \hline
 3032 \\
 4548 \\
 \hline
 4851 \overline{)2}
 \end{array}$$

How to prove the last question, or any other of like kind. If one acre of Land cost 6 pound 8 shillings, how many acres shall be bought for 485 pounds, 4 shillings? Divide your number of pounds and shillings by one half of the number of shillings in the price given, adding a cypher to your number of pounds, and the quotient is the number of acres of Land the said sum will buy at that rate.

Example.

The given sum is 4851 pounds, 2 primes, or 4 shillings; which divided by half the given price, which is 64 shillings, brings into the quotient 758 acres, and so of any other sum.

5
37 Acres.
48752 (558
6777
88

A Merchant bought Cambricks cost him 855 pounds, 18 shillings; the question is, How many pieces he had, paying for every piece 26 shillings? Answer, add a cypher to your given number, which is 855 pounds, 9 primes, makes 85590, which divide by half the price given, which is 13 1:2; or divide by 135, the quotient will be 634 pieces: now the reason whereof a cypher is added to the number given, having 9 primes in it, is, because I divide by 13 1:2, which hath one fraction; and this rule is general.

Example:

What cost 634 pieces at 27 shillings?

		634
		13 1:2
477	pieces	-----
87777	(634	1902
77777		64
777		317
7		-----

The Proof 855|9

H 5

How

How to prove one question in the Rules of Practice by the working of another.

If you will prove any question in the Rules of Practice, by a second example, mark the Complement, or want of your given price from one pound, and work the same number at that price which doth want, and the total of those two sums added together, makes the just number of pounds of the sum given.

Example.

At 16 shillings a piece of Fustian, what will 320 pieces cost? Answer, multiply 8, makes 256 pounds 0 prime.

Again, 16 shillings your given price wanted 4 shillings of one pound, wherefore work 320 at 4 shillings, which is multiplied by 2 primes, makes 64 pounds, 0 prime, the total is 320 pounds, which proves the former work.

320	320	256
8	2	64
<hr/>		
2560	64 0	320 pounds.

Example.

At 13 shillings a piece of Lawn, what will 753 pieces cost? 752 by 6 1:2, makes 88 pounds, 8 primes.

At

At 7 shillings a piece, what 752 pieces?
 752 by 3 l:2, makes 263 pounds, 2 primes,
 total is 752 pounds.

Example.

$ \begin{array}{r} 752 \\ 6 \text{ l:} 2 \\ \hline 4512 \\ 376 \\ \hline 488 \overline{)8} \\ 2632 \\ 4888 \\ \hline 752 \overline{)0} \end{array} $	$ \begin{array}{r} 752 \\ 3 \text{ l:} 2 \\ \hline 2256 \\ 376 \\ \hline 263 \overline{)2} \end{array} $
--	--

Rule

Rules of Practice by the

Third TABLE,

The most excellent of all other.

The third Table.

The ~~fourth~~ ^{fourth} Table.*The aliquot parts
of 24.*

d.	par.	d.	par.
1	24.	13	2. 24
2	12.	14	3. 4
3	8.	15	2. 8
4	6.	16	3. 3
5	12.8	17	3.4.8
6	4.	18	2. 4
7	8.6	19	2.8.6
8	3.	20	2. 3
9	4.8	21	2.4.8
10	4.6	22	2.4.6
11	3.8	23	2.3.8
12	2.	24	$\frac{1}{10}$

*The parts of a
shilling.*

d.	par.	d.	2.	12
$\frac{1}{4}$	48	7	1.	$\frac{1}{2}$
$\frac{1}{2}$	24	8	2.	4
$\frac{2}{3}$	18	9	2.	3
$\frac{3}{4}$	16	10	2	3.6
		11	Idem.	
		12		
d.				
1	1			
2	2			
3	3			
4	4			
6	6			

Divisors.

Divide

le

2

8

5

1

1

e

A3

At 11 pence the yard Canvas, what will 2356 cost? For 8 pence divide by 3 makes 78 pound, 5 primes, 1: 3 or 8 pence; and for 3 pence divide by 8, makes 29 pound, 4 primes, 1: 2, or 12 pence; the total is 107 pound, 19 shillings, 8 pence.

xxx	l.		d.	xxx	l.		
2356	(78	5	8	2356	(29	4	1:2
333				888			

l.	s.	d.
29	9	0
78	10	0

707	19	0
-----	----	---

A second Example the proof of the last.

At 13 pence a pound fine Sugar, what will 2356 pounds cost? for 12 pence divide by 2, makes 117 pounds, 8 primes, or 16 shillings: then for 1 peny divide by 24, makes 9 pounds, 8 primes, 4 pence, the total is 127 pounds, 12 shillings, 4 pence; which added to the former sum in the last example, makes 235 pounds, 12 s. and so much will 2356 pounds cost, at 2 shillings a pound, because the two given prizes make one prime, or two shillings.

Example.

Example.

#	l.		#	l.		d.
2356	(117	8	d.	2356	(9	8
xxxx	9	8	4	244		4
<hr/>						
127				6	4	

127	12	4
107	19	8
<hr/>		
235	12	0

At 16 pence a pound Sugar, what will 78432 pound cost? work for 8 pence, and double the sum, makes 5223 pounds, eight primes, or 16 shillings.

At 8 pence a pound Almonds, what will 78432 pound cost? divide by 3 makes 2614 pound, 4 primes, or 8 shillings; which added with the former Example, makes 7843 pound, 2 primes, which is the price that 7843. pound will cost at 2s, a pound, and proves both examples true.

Examples

Example.

<i>s s s</i>	<i>l.</i>	<i> </i>
78432	(2614	4
33333	2614	4
<hr/>		
	5828	8
<i>s s s</i>	<i>l.</i>	<i>l</i>
78432	(2614	4
33333	5228	8
<hr/>		
	7843	2

At 18 pence a pound Comfits, what will 78432 pounds cost? For 12 pence take half the given number; and for 6 pence take half of that sum, which added into one total, makes 5882 pounds, 4 primes.

$$\begin{array}{r}
 78432 \\
 \hline
 39216 \\
 19608 \\
 \hline
 \end{array}$$

5882|4 Primes.

The Total is 5882 *l.* 8 *s.* 0 pence.

At 6 pence a pound small Ginger, what will 78432 *l.* cost? *Answer* makes 1960 pounds,

pounds, 8 primes or 15 shillings; which added to 5882 pounds, 8 shillings, makes 7843 pounds, 2 primes, the price at 2 shillings.

32	l. 1	5882	4
78432	(1960 8	1960	8

	Proof	7843	4

These Tables may serve also if the price be above two shillings, or one prime; as if you shall say, at 3 shillings 6 pence an ell, what 782 ells? here I see the given price is compounded of 3 times 6 pence; wherefore I work first for 6 pence, in dividing by 4, makes 16 pounds 11 shillings, which multiply by 7, makes 136 pounds 11 shillings for the price of 782 ells at 3 s. 6 d. the ell.

At 6 pence an ell, what 782 ells? Find for 6 pence, 19 pounds 11 shillings, which added to the former sum in the last example, makes 156 pounds, 8 shillings, which is the sum that 782 ells will cost at 4 shillings the ell.

Example

Example.

32	l.		s.
782	(19	5	12 or 11

l.	s.		
19	11		782
7	7		2

136 17 The proof 256|4

At 4 shillings 8 pence the ell Holland, what will 2148 ells cost? I find 4 shillings 8 pence to be 14 groats, so dividing by 6 for one groat, makes 35 pounds, 8 primes; which multiply by 14, makes 501 pounds 4 shillings.

			358
			14
34	l.		
2148	(35	8	1432
666			358

The Total 501, 2 Primes.

At 15 pence a gross of points, what will 2256 gross cost? 15 pence is 5 times 3 d. and so I divide 2256 by 8, makes 28 l. primes; which multiply by 5, makes 121 pounds.

62

$\begin{array}{r} 8x \\ 2298 \\ 88x \end{array}$
 $\begin{array}{l} l. \quad | \\ (28 \quad 2 \end{array}$

$\begin{array}{r} 282 \\ 5 \\ \hline 1410 \end{array}$

Rules of Practice by the fourth Table.

If the number of the price given be any Aliquot part of a shilling, enter the fourth Table, and there you shall find a Divisor, by the which if you divide your number given, the quotient will be shillings, and the remainder parts of one shilling. Then to convert your shillings into pounds, take one half of the quotient, cutting off lower number for shillings, and the rest is pounds.

Example.

At 3 farthings a pound Prunes, what will 756 pound weight cost? Search in the fourth Table, and you shall find 16 for your divisor; by the which if you divide 756, the quotient is 47 shillings, 1:4 or 3 pence.

$\begin{array}{r} 114 \\ 158 \\ 166 \end{array}$
 $\begin{array}{l} s. \\ (47 \quad 1:4 \end{array}$
 $\begin{array}{r} 2 \\ 87988x \\ 166666 \end{array}$
 $\begin{array}{l} 4 \\ (56103 \quad 1:4 \\ \hline 2805 \end{array}$
 $\begin{array}{l} s. \\ 3 \quad d. \end{array}$

At

At one half penny a pound Copperas, what will 8756 pounds cost? Divide by 24 makes 364 shillings, of which the one half cutting off the 4 shillings, is 18 pounds, 4 shillings and 20 half pence remaining, the total is 18 pounds 4 shillings, 10 pence.

$$\begin{array}{r}
 32 \\
 \begin{array}{r}
 24 \overline{) 8756} \\
 48 \\
 \hline
 3956 \\
 24 \overline{) 3956} \\
 24 \\
 \hline
 1576 \\
 12 \overline{) 1576} \\
 12 \\
 \hline
 376 \\
 24 \overline{) 376} \\
 24 \\
 \hline
 136 \\
 12 \overline{) 136} \\
 12 \\
 \hline
 16 \\
 12 \overline{) 16} \\
 12 \\
 \hline
 4
 \end{array}
 \end{array}$$

At 4 pence a pound Licoras, what will 789 pounds cost? Divide by 3, makes 13 pounds, 3 shillings.

Again, at six pence a pound, what will 8579 pounds cost? Divide by 2, makes 214 pounds, 9 shillings 6 pence.

1 Example.

$$\begin{array}{r}
 2 \\
 789 \quad (63 \\
 333 \quad \hline
 13 \text{ l. } 3 \text{ s.}
 \end{array}$$

2 Example.

$$\begin{array}{r}
 2 \\
 8579 \quad (4289 \text{ 1:2 or 6} \\
 2222 \quad \hline
 214 \text{ l. } 9 \text{ s. } 6 \text{ d.}
 \end{array}$$

General Rules of Practice without Tables.

Multiply your number given by the sum of pence, that one yard, piece, pound or ell doth cost, and the product will be the sum of pence

as,
24
half
nds,
the

will
13
will
kes

1.6

2.

all
of
ce

At 3 shillings 7 pence a yard Holland,
what will 752 ells cost? Multiply 752 by
43 pence, the price of one ell, makes
32336; which divided as is before taught,
makes 134 pound, 14 s. 8 d.

Example.

$$\begin{array}{r}
 752 \\
 43 \\
 \hline
 2256 \\
 3008 \\
 \hline
 32336
 \end{array}$$

Grats.
34336 (8084

Grats.
2242
8684
6666

l. d.
(134 14 8

At 7 shillings 11 pence the ell Cam-
bricks, that will 856 ells cost? Reduce 7
shillings 11 pence into pence, makes 95
pence; by which multiply 856, makes
81320: which divided as before, makes
338 pound, 16 shillings, 8 pence.

Example

Example.

856
95

Pence.

2

4280
7704

8562 (2033

81320

Groats

2552

25529

6666

l. \$ d.
(338 18 8

At 2 shillings 11 pence an ell of Hol-
land, what will 7856 ells cost? multiply
and divide as is before taught, makes 1145 l.
13 shillings 4 pence.

Example.

Example.

7856

35

pence.

~~328~~

39280

~~274968~~ (68740

2356|8

~~44448~~

274960

Groats.

~~2344~~

l.

~~88748~~ (1145 6~~88888~~

At 17 s. 7 pence a yard Broad-cloth, what will 7856 yards cost? multiply by 211, the price of one yard, and divide as before, makes 6906 pounds, 7 primes.

Example.

7856

211

~~22~~

Groats.

7856

~~2857828~~ (4144 4

7856

~~444|444~~

15712

1657616

Groats.

~~342~~

l.

5 d.

~~44444~~ (6906.17 8~~88888~~

If

If your given price have any farthings in it, then reduce your price into farthings, and multiply your given number by those farthings and the product will be the number of farthings which your sum will cost; then divide that product by 16, makes the quotient Groats, and the remainder will be farthings, always less then 16, or 1 Groat. Secondly, Divide that quotient of Groats by 6, makes pounds and primes, as before.

Example.

At 5 shillings 1 penny, 1 half penny an ounce plate, what will 356 ounces cost? Redvce 5 shillings, 1 penny, half penny, into farthings, makes 246 farthings: by which multiply 356, makes 87576 farthings; which divided by 16, makes 5473 Groats, and 8 farthings will remain; which divide again by 6, makes 91 pounds, 2 primes and 1 Groat will remain, total is 91 pounds, 4 shillings, 6 pence.

At 6 shillings 9 pence farthing an ounce of gilt Plate, what will 3542 ounces cost? multiply your shillings by 48, the farthings which are in one shilling, makes 288, to the which add 37 farthings, which are in 9 pence farthing, makes 325 farthings; and then work as before is taught, and you shall find 1199 pounds, shillings, 3 pence half penny.

I

Example.

Example.

3542	Farthings.	
325	5 1	
<hr/>		35714
17710	555555	(71 946
7084	55555	
10626	5555	
<hr/>		
1151150		
555	L	
55948	(1199	
55555		

Another way to work Practice.

Divide your number of yards, ells, or pieces, by 240, adding a cypher, to your number given, and then multiply the quotient by your price, and the product is the sum of pounds and shillings that the given number will cost.

At 17 pence an ell of Canvas, what will 7848 ells cost? Add a cypher, and divide 78480 by 240, and the quotient will be 32 pounds, 7 primes, which multiply by 17 pence the price, makes 555 pounds, 9 primes, or 18 shillings.

Example

Example.

$ \begin{array}{r} 18486 \quad (32 7 \\ \times 4446 \\ \hline \end{array} $	$ \begin{array}{r} 327 \\ 17 \\ \hline 2289 \\ 327 \\ \hline \end{array} $
---	---

555|9

At 3 shillings 5 pence an ell of Holland, what will 7020 ells cost? Divide 7020 by 240 makes 2 pounds, 9 primes, and there will remain 6; which multiply by 48 pence, the price of one ell, makes 118 pounds, 9 primes, or 18 shillings, and then the 6 ells makes 1 pound 6 pence; the total is 119 pounds, 18 shillings 6 pence.

Example.

$ \begin{array}{r} 1828 \quad (2 9 \\ \times 4446 \\ \hline \end{array} $	$ \begin{array}{r} 2 9 \\ 4 \quad 1 \\ \hline 29 \\ 116 \\ \hline \end{array} $
---	--

$ \begin{array}{r} 1. \quad d. \\ 3 \quad 5 \\ \quad 6 \\ \hline 20 \quad 6 \end{array} $	$ \begin{array}{r} 1. \quad s. \quad d. \\ 18 \quad 18 \quad 0 \\ 1 \quad 00 \quad 6 \\ \hline 119 \quad 18 \quad 6 \end{array} $	<p>At</p>
---	---	-----------

At 19 pence an ell of Holland, what will
 325440 ells cost? Divide 325440 by 240,
 makes 1356: which multiply by 19 pence,
 the price of one ell, makes 2576 pounds, 8
 shillings.

$$\begin{array}{r}
 325440 \\
 \times 19 \\
 \hline
 292896 \\
 600880 \\
 \hline
 6183360
 \end{array}
 \quad
 \begin{array}{r}
 1356 \\
 \times 19 \\
 \hline
 12204 \\
 13560 \\
 \hline
 25764
 \end{array}$$

The

The Golden Rule.

Of single proportion Direct,
or, *The Rule of Three*, called
The Golden Rule.

THE Rule of Three, or Rule of Proportion, of all others is the most excellent, and therefore (not without desert) commonly called the *Golden Rule*; the working is performed and proved by Multiplication and Division, the use thereof is three numbers or terms being given, to find a fourth proportionall; all the difficulty is in the right placing the terms: For the better understanding of which, these Rules and examples following are necessary, as suppose four men spend eleven shillings a day, how much will eight spend according to the same proportion? place your number thus,

4 ————— 11 shillings.
8 —————

Then multiply the second number by the third, and divide the product by the first,
I 3 the

the quotient will be the number desired, that is to say, Multiply 11 the second number, by 8 the third, the product is 88, as in this example,

$$\begin{array}{r} 11 \\ 8 \\ \hline \end{array}$$

Product. 88

Then divide the product by 4 the first number, the quotient is 22, as in this example,

88 (22 quotient.

44

The proportional number desired, which place thus,

4—11 shillings.
8—12 shillings.

Another way to place the term at length.

The second Example.

If 26 men make a Wall of 364 foot in a day, how many foot will 364 men make? Place your number thus,

26—364—364

Then multiply the second number by the third, that is, multiply 364 by 364, the product is 132496, as appears in this example,

364

The Golden Rule.

165

$$\begin{array}{r}
 364 \\
 364 \\
 \hline
 1456 \\
 2184 \\
 1092 \\
 \hline
 \end{array}$$

Product. 132496

Then divide the product by the first, that is, divide 132496 by 26, the quotient is 5096, as appears in this example.

$$\begin{array}{r}
 26 \\
 26 \text{ } 5096 \\
 \hline
 132496 \\
 26 \times 26 \\
 \hline
 \times
 \end{array}$$

So that according to the rule of Proportion, if 26 make 364, 364 will make 5096, which place either thus,

$$\begin{array}{l}
 26-364 \\
 364-5096
 \end{array}
 \left. \vphantom{\begin{array}{l} 26-364 \\ 364-5096 \end{array}} \right\} \text{or thus, } 26-364:364:5096$$

The third Example.

If 45 pound will pay 3560 men for one day, how many days will 364 pounds pay them. Multiply the second 4560 by the third 364, the product is 1295840, as in this example,

I 4

3560

$$\begin{array}{r}
 3560 \\
 362 \overline{) 1295840} \\
 \underline{14240} \\
 21360 \\
 \underline{10680} \\
 \hline
 \end{array}$$

Product. 1295840

Then divide the product of the second by the first number 45, the quotient will be 28796, and 20 pounds overplus, as in this example.

$$\begin{array}{r}
 3502 \quad (2 \\
 33425 \\
 47739 \text{ quotient.} \\
 2291844 \quad (28796 \\
 4444
 \end{array}$$

So that if 45 pounds will pay 3560 men for one day, 362 pounds will pay 28796 men for a day, and 20 pounds to spare, 28796 being the fourth proportional number or term desired: or if the question be desired for more then one day, it is but multiplying the 4th. term by the number of days desired, as if 5 men make 34 pieces in one day, how many pieces will 15 men make in 12 days? First, find out the fourth proportional

tional number, and multiply it by 12, the product is the term desired, that is, first multiply the second term 34, by the third 15, the Product is 510, then divide the Product by the first term 5, the quotient is 102, then multiply the quotient by 12, and addition of days, and the Product is 1224, the term desired: for the finding out the fourth proportional number in measure, weights, time, and motion, the examples following will sufficiently demonstrate.

1 Example.

If 90 yards of Cloth cost 23 pounds, what cost 346 yards? Multiply 346 by 23, the Product is 1953, as in this example.

$$\begin{array}{r}
 346 \\
 23 \\
 \hline
 1038 \\
 692 \\
 \hline
 7958
 \end{array}$$

Then divide the Product by the first number 90, the quotient is 88 pound and 38.90 of a pound, as in this example.

73

l.

7958

(88, 38: 90 of a l.

994

If 124 pounds gain 37 pounds 12 shillings, what will 758 pounds gain?

37 1:2
20

758
752

752

1.6

140

240

E

28E

7958

l.

177888

(4596

1:12: 124

495

222222

2222

22

57016

Now to work this last Example, and all other, after a more brief and exact manner.

Divide the third number by the first, and by the quotient multiply the second, and the product is the answer.

Example.

If 356 ells cost 137 pounds 12 shillings 9 pence, what cost 2848 ells?

137

The Golden Rule.

169

$$\begin{array}{r}
 \begin{array}{r}
 0 \\
 2848 \end{array} \begin{array}{l} (8 \\ 356 \end{array} \quad \begin{array}{r} 137 \\ 8 \end{array} \quad \begin{array}{r} 12 \\ 9 \end{array} \quad \begin{array}{r} 9 \\ 6 \end{array} \\
 \hline
 \begin{array}{r} 1096 \\ 5 \end{array} \quad \begin{array}{r} 96 \\ 6 \end{array} \quad \begin{array}{r} 72 \\ 72 \end{array} \quad \begin{array}{r} (6 \\ 2 \end{array} \\
 \hline
 1101 \quad 2
 \end{array}$$

Total is, 1101 / 2 s O d.

First, divide 2848 by 356, the quotient is 8: by which I multiply 137 pounds 12 shillings 9 pence, the Products are 1096 pounds, 96 shillings, 72 pence: then divide 72 by 12, is 6 shillings; which added to 96 shillings, makes 102 shillings, or 5 pounds 2 shillings; the total is 1101 pounds 2 shillings, as before.

Example.

If 124 yards cost 17 pounds ten shillings 1 penny, what cost 744 yards?

	l.	s.	d.
17	10	1	
6			

744 (6

744

102	60	6
-----	----	---

3

105 0 6

If 31 pieces of Raisins cost 19 pounds, two shillings two pence, what will 112 pieces cost at that rate?

3 Example.

	l.	s.	d.
19	2	7	
3½			

744

744 (3½, or ½

744

57	9	1:2
9	10	

66 19 1:2

If 356 pieces cost 137 pounds, 12 shillings 9 pence, what will 2848 pieces cost at that rate?

33033

The Golden Rule.

171

33033
2848

137 12 9
20

20224

2752
12

244C4

10112

12202

33033

20224

24404

66C66

94077984

Example.

22

22822

2282222

356 94077984 (264264

88888888

71264264

2132132

14714

21

94077984

Example.

Divisor then the question is answerable by the direct Rule, and the product of the two later numbers is your Dividend.

Example.

If 13 Cannons spend 358 pounds of powder, what will 5 Cannons spend? Now here the question is what 5 Cannons will spend. I answer lesse then 13 pounds, wherefore by this Rule, the greater of the two extremes 13, is the Divisor: wherefore I multiply 358 by 5, and divide by 13, makes 137 pounds, 6: 13 that 5 Cannons will spend.

1 Example.

If 13 Cannons spend 358. pounds of powder, what will 5 Cannons spend.

358	5	13
5	409	1.
1790	2125	(137 9:13)
	2333	
	2333	

2 Example.

I lent my friend 115 pounds for 7 moneths, and when I came to him to require the like kindnesse; he could lend me but 54 pound; the question is, how long he should forbear that 54 pounds to make a requital, or to equal my time and kindnesse.

If

If 115 pounds require 7 moneths; what will 54 pound require? Here the answer in reason is, that 54 pounds must be longer time forborn then 115 pounds, and so the answer is more times then 115 pounds, so that I find the lesser of my extremes 54, is my Divisor, and the question answerable by the Rule conversed, so that I multiply 115 by 7, makes 805; which divided by 54, makes 14 moneths, 49:54 of a moneth, or 14 moneths 25 days 23: 25.

Example.

115	4	
7	269	Moneths.
<hr/>	805	(14 49:54)
805	544	
	5	
49		
28	2	
<hr/>	292	Days.
392	5442	(25:22:25)
98	544	
<hr/>	5	

1372

4. Example.

A Captain of a Band of men is besieged in a City, having with him 7200 men, and his

his victuals will serve the whole Company but 7 moneths, and there is no help left to have any fresh victuals until 16 moneths; the question is, how many men he shall send away to make the victuals serve for 16 moneths? Answer; Less then 7200 men.

If 7 moneths require 7200 men, how many will 16 moneths ask?

$$\begin{array}{r}
 72.0 \\
 7 \\
 \hline
 50400
 \end{array}
 \qquad
 \begin{array}{r}
 33 \\
 228 \\
 \hline
 111111
 \end{array}
 \qquad
 \begin{array}{r}
 178 \\
 3150 \\
 \hline
 111111
 \end{array}$$

When Wheat was sold at three shillings eight pence the bushel, the penny loaf of bread weighed 6 ounces; what shall the same loaf of bread weigh when Wheat is sold for two shillings the bushel? Answer, more then 11 ounces.

If 44 pence give 6 ounces, what will 24 pence give?

$$\begin{array}{r}
 44 \\
 6 \\
 \hline
 264
 \end{array}
 \qquad
 \begin{array}{r}
 228 \\
 244 \\
 \hline
 2
 \end{array}$$

If 356 men dig a Trench in 24 days in how many days will 200 men make the same? Answer, in more days; 42 days, 17 hours, 7:25.

If

176

The Golden Rule.

If 356 men require 24 days, how many will 100 men require?

356	24	1	Days.
<hr style="border-top: 1px solid black;"/>		8544	(42 144:200
1424		2200	
712			
<hr style="border-top: 1px solid black;"/>			
8544			

144	24	1	Hours.
<hr style="border-top: 1px solid black;"/>		3456	(17 7:25
576		2200	
288			
<hr style="border-top: 1px solid black;"/>			
3456			

Or thus; Considering the numbers, 200 may be had in 356 once, therefore for 200 take 24 days; then for 356 take 18 days, total 42 days; then there will remain 6 to be multiplied by 24, makes 144:200 parts of a day, as before.

If 112 pound cost 3 pounds 5 shillings 5 pence, what will 3136 pounds cost? Divide 3136 by 112, make 28; which multiply by 3 pounds,

The Golden Rule.

177

3 pounds 5 shillings 5 pence, makes 91 pounds, 11 shillings 8 pence.

	l.	s.	d.
	28	28	28
	3	5	5
			28
89			
3x38 (28	<hr/>		348 (11
3x2x	84	11	3x2x
3x	7	140	3
	<hr/>		
	91	11	8

If 100 pounds gain 7 pounds, what sum of money will gain 85 at that rate? Answer.

If 7 pounds require 100 pounds what will 85 pounds require?

3x32	l.	85
8x66	(1214 2:7	100
1117		<hr/>
		8500

Or otherwise, divide 85 by 7, makes 12 1:7, by which multiply 100, makes 1214 pounds, 2: 7 of a pound.

3x	100
8x (12 1:7	12 1:7
11	<hr/>
	1214 2:7

Or

Or otherwise, Divide 100 by 7, makes
14 1: 7; by which multiply 85, makes
1214 pound, 2: 7.

Example.

$\begin{array}{r} 3x \\ 355 \end{array} \begin{array}{l} (14 \ 27) \\ 77 \end{array}$	$\begin{array}{r} 85 \\ 14 \ 2:7 \\ \hline 340 \\ 85 \\ \hline 24 \ 1:7 \\ \hline 1214 \ 1:7 \end{array}$
---	---

Kerseys at 54 shillings the piece, are put
in Barter, at 3 pounds the piece, how shall
Wool worth 24 shillings the Tod, be set in
Barter to make the bargain equal?

If 54 shillings be 60 shillings, what will
24 shillings make?

Answer, For more then 24 shillings, and
less then 54, so that 54 is the Divisor, and
multiplying 24 by 60, makes 1440; which
divided by 54, makes 26 shillings, 2:3. or
8 pence.

If 54 shillings be 60 shillings, what will
24 shillings make?

$\begin{array}{r} 3 \\ 266 \end{array} \begin{array}{l} (26 \ 36:54) \\ 54 \end{array}$	$\begin{array}{r} 34 \\ 60 \\ \hline 1440 \end{array}$
---	--

or 2:3, or 8

The Golden Rule.

179

If 6 sheep cost 58 shillings, how many shall I buy for 124 pounds? multiply 124 by 58, makes 7192; which divide by 6, makes 1198 sheep, 2:3.

$$\begin{array}{r}
 124 \\
 58 \\
 \hline
 992 \\
 620 \\
 \hline
 7192
 \end{array}
 \quad
 \begin{array}{r}
 *** \\
 7192 \quad 1198 \quad 2:3 \\
 6666
 \end{array}$$

Or otherwise, divide 58 by 6, makes 9:2:3, by which multiply 124, makes 1198 2:3, as before.

Example.

$$\begin{array}{r}
 124 \\
 9 \quad 2:3 \\
 \hline
 4 \\
 58 \quad (9 \quad 2:3 \quad 1116 \\
 6 \quad 82 \quad 2:3 \\
 \hline
 1198 \quad 2:3
 \end{array}$$

A Merchant at *Sevil* delivereth 1500 Rials, to receive for every 11 being a Ducad in *London* 5 shillings 10 pence Sterling money, how much must he receive?

If

If 11 Ryals be 70 pence, what are 1500 Ryals?

	<i>Pence.</i>
7	s 1
xxxx (136 4:11	x387 l. 1
xxxx	85xxx (29 7
70	xxxx
952	
25	

9545 Total is 39 l. 15 s. 5 d.

At 13 pounds in 100 pound profit, of what stock came 3274 pounds? Answer, Divide 3274 pounds by 113 pounds, makes 2879 pounds, 39:113 of a pound, add two cyphers to the given number.

s 83	
xxxxx9	l.
3274xx	(2897 39:113 of a pound,
xxxxxx	
xx	

A Merchant received for principal and gain 328, wherein he found he had gained clear \$6 pounds, what did he gain upon the 100 pounds? Answer, Multiply 100 by 56 the gains, makes 5600; which divide by 328, and the quotient is 17 pounds, 3:41 in smallest terms.

100

$$\begin{array}{r}
 100 \\
 56 \times 3 \times 4 \quad 1. \\
 \hline 5600 \quad 3 \times 88 \quad (17.24:328, \text{ or } 3:41 \text{ of a } l. \\
 3x
 \end{array}$$

If 112 pounds cost 7 pounds, 6 shillings, how may I sell to gain 10 pounds upon the 100 pounds? Answer, Take the tenth part of 7 pounds, 6 shillings, or of 146 shillings, which is 14 shillings, 3:5 of a shilling; which added to the price, makes 8 pounds 7 pence, 1:5 of a penny.

$$\begin{array}{r}
 l. \quad s. \quad \quad \quad l. \quad s. \\
 7 \quad 6 \quad \quad \quad 7 \quad 6 \\
 20 \quad 3 \times 8 \quad (14 \quad 3:5 \quad 14 \quad 3:5 \\
 \hline 146 \quad \quad \quad 8 \quad 00 \mid 74\frac{1}{2}
 \end{array}$$

Example.

If 100 pounds exchange by 7 pound 2 shillings, what is one pound? Answer, 71:100 parts of a pound: wherefore multiply 71 by 240, and divide by 100, makes 17 pence, 12:5 of a penny.

$$\begin{array}{r}
 71 \\
 240 \\
 \hline 3840 \quad \times 7 \times 4 \times 4 \times 4 \\
 142 \quad \times \times \times \times \times \times \times \\
 \hline 17040
 \end{array}
 \quad
 \begin{array}{r}
 l. \quad \quad \quad \frac{1}{2} \\
 (17 \quad 40:100 \quad 1 \\
 71:100
 \end{array}$$

If

*How to find whether your numbers given
be proportional, or not.*

Divide your third number by the first, and if the quotient be an even number, and nothing remain of your Dividend, then the first and third numbers are proportional in whole numbers, as in the last example, the first number was 107, and the third number 321, so that in dividing the third number by the first, the quotient is 3 and 0 remains: wherefore I conclude that the first and third numbers are proportionals in whole numbers, and that the third doth contain the first just three times, and so often must the fourth number sought for, contain the second; and I conclude, that three times 17 pounds, 12 shillings, which is 52 pounds 16 shillings, is the fourth proportional number sought, as appears by the ordinary form of work in the last example.

321 (3
367

l.	s.
17	12
3	3
<hr/>	
52	16
K	16

If 36 ells of Cloth cost 13 pounds, 4 shillings, 1 penny, what will 432 ells cost at that rate? Divide 432 by 36, makes 12; by which multiply your second number, 13 pounds 4 shillings one penny, makes 158 pounds, 9 shillings.

	13	4	1
	12	12	12
432 (12	<hr/>		
36	28	9	0
3	13		
	<hr/>		
	158	9	0

A doth lend unto B 600 pounds for 8 moneths, the question is, how much B shall lend unto A for 12 moneths to recompence him, not reckoning compound interest? Answer, if 8 moneths require 600 pounds, what will 12 moneths require? the reason is less then 600 pounds, wherefore divide 600 pounds by 12, makes 50; wick multiply by 8, makes 400 pounds.

Or otherwise by proportion, as 8 is to 12, so must 600 be to 400 pounds, 2:3 parts of 600 pounds.

The Golden Rule.

185

If the number be not exactly proportional, yet there is a great abbreviation to be made of the work of Reduction, Multiplication, and Division in the working of most Examples in the *Golden Rule*. As for example.

If 19 Barrels of Figs cost 16 pounds, 12 shillings, what shall 58 Barrels cost? Here dividing 58 by 19, the quotient is 3, and 1 will remain; wherefore I take 3 times 16 pounds, 12 shillings for 57 Barrels, and I have to work but for the one remaining; which is but to divide 16 pounds, 12 shillings by 19, makes 17 shillings, 9: 19 of one shilling, the total is 50 pounds, 13 shillings, 9: 19 shillings.

l.		s.			l.		s.	
16	12	49	16	9	16	12	49	9
3	3		17	19	17	19		
<hr/>		<hr/>			<hr/>		<hr/>	
49	16	50	13	9:19				

If 356 ells of Holland cost 124 pounds, 2 shillings 3 pence, what will 7259 ells cost at that rate? Reduce 124 pounds 2 shillings 3 pence into pence, makes 29787 d. which multiply by 7259, makes 216223833
K 2 pence

pence, which divide by 359, makes 607370;
which divided by 240 pence, makes 253
pounds, 170 pence, or 14 shillings 2
pence.

Example.

			29787
l.	s.	d.	7279
124	2	3	
20			
<hr/>			
2482			64549453
12			14396136
<hr/>			111602
4967			48447
2482			14353
<hr/>			506
29787			181
<hr/>			1
			<hr/>
			216223833

$$\begin{array}{r}
 356 \overline{) 216223833} \\
 \underline{21360282} \\
 24969 \\
 \underline{104} \\
 2
 \end{array}$$

216223833 The Proof.

$$\begin{array}{r}
 124 \text{ l. } 9 \text{ s. } 1 \text{ p.} \\
 7259 \text{ ells} \\
 \hline
 900841 \text{ l. } 9 \text{ s. } 1 \text{ p.}
 \end{array}$$

A second way more briefly to work this question, or any other of like nature, is this: multiply the third number by the pounds and primes, or shillings and pence, and divide the Product by the first number, and the Quotient will be the fourth number sought. In the last example, 7259 ells was the third number, which multiply by 124 l. 1 prime, or 2 s. makes 900841 l. 9 primes: then

them also 7259 by 3 pence makes 21777 pence; which divided by 240, makes 90 pounds 14 shillings 9 pence; then add those two sums into one total, makes 900932|6 primes 9 pence; leave out 9, and then divide the residue by 336, makes 2530 pounds 7 primes, and 54 : 356; which with the 9 d. brings out the two pence, as in the last Example.

Example.

7259

124

7259

29036

41 14518

7259

900841|9 d.

90|7 9

900932

7259

$$\begin{array}{r}
 d. \\
 7259 \\
 3 \\
 \hline
 21777
 \end{array}$$

$$\begin{array}{r}
 d. \\
 3139 \quad l. \quad 1 \\
 21777 \quad (90 \quad 7 \\
 24448 \\
 22
 \end{array}$$

Primes.

$$\begin{array}{r}
 2d \\
 2882134 \quad l. \quad 1 \\
 8889328 \quad (2530 \quad 7 \\
 3186666 \\
 31111 \\
 333
 \end{array}$$

If 24 pieces of Raisins cost 25 pounds, 8 shillings, what will 324 pieces cost? Multiply 324 by 25 pounds 4 primes, makes 8229, 6 primes: which if you divide by 24, the quotient will be 342 pounds, 9 primes, or 18 shillings without Reduction, as is the example following.

K 4

Example.

Example.

324			
254			
<hr/>			
1296	8	8	8
1620	2	2	2
648	2	2	2
<hr/>			
82296	342	1	8

If 25 pounds gain 1 pound 8 shillings, what will 725 pounds gain at that rate? Multiply 725 by 1 pound 4 primes, makes 10150; which divided by 25, makes 40 pounds, 6 primes, or 12 shillings.

725			
14			
<hr/>			
2900	40	1	6
725	2	2	2
<hr/>			
10150			

And

And in this sort may divers other questions be wrought in pounds and shillings without Reduction, which I thought good to give a taste of, but I will proceed here no further, because I purpose in the second Part of this Book to speak of them at large in the Treatise of *Decimal Arithmetick*, whereby all manner of questions are to be wrought by *Multiplication* and *Division* in pounds, shillings, and pence, without *Reduction*, as shall appear in their several places following. And now I will proceed to speak something on the *Rule of three Direct* and *Converse* in *Fractional* operations, wherein I will be as brief as I may, not intending to increase this little Treatise intended for a Pocket Book, into over large a Volume. . . .

The Rule of Three in Fractions.

If your 3 numbers given be all Fractions, multiply the third by the second, and divide the Product by the first, and the quotient will be the fourth proportional number sought for.

Example.

If 3:4 of a yard of Holland cost 4:5 of a pound, what shall 5:6 of a yard cost at that rate? Multiply 5:6 by 4:5, makes 20:30, or 2:3, which divide by 3:4, makes 8:9 of one pound, or 17 shillings, 7:9 of one shilling.

20	8
4:5	2:3
5:6	3:4
30	9

If 7:8 of one ell of cloth cost 9:12 of a pound, what will 7 ells cost? Make 17 fraction-wise, and multiply 17:1, by 9:12, makes 153:12, which will both be abbreviated by 3, makes 51:4, which divided by 7:8 makes 408:28 parts of a pound, or in smaller terms 102:7; then divide 102 by 7 makes 14 pound, 4:7 of one pound for the price.

153	408	14
17:1	51:4	228 l.
9:12	7:8	408 (14 4:7
12	28	288
		2

2 Rule

2 Rule.

If all your 3 numbers given, be Fractions; multiply the Numerator of the first Fraction by the Denominator of the other two Fractions for to make your Divisor. Then multiply the Denominator of your first Fraction by the Numerators of your other two Fractions, to make your Dividend, and then divide by your Divisor, and the quotient is the answer sought: but if your Divisor be greater then your Dividend, then the quotient is a fraction less then a unite.

Example.

If 3:4 of a yard cost 4:5 of a pound, what cost 5:6 of a yard? Multiply 3 the Numerator of the first Fraction by 5 and 6 the Denominators of the other two Fractions, make 90 for your Divisor: then multiply 4 the Denominator of your first Fraction by 4 and 5 the Numerators of your other two Fractions, makes 80 for your Dividend. Now because your Divisor is greater then your Dividend, place them Fraction-wise thus, 80:90 of one li. or in less terms, 8 9 of a li.

Example.

Example.

	90			
If	3:4	of a yard	} makes	1.
cost	4:5	of a pound		8:9
what	5 6	of ay ard		
	80			

Again, if 7:8 of an ell cost 2:3. of a shilling. what will 34 ells cost?

	21			
If	7:8	of an ell,		
cost	2:3	of a shilling,		
what	34:1	ells cost	1	
	16		228	s.
	<hr/>		888	(25 $\frac{19}{22}$)
	104		288	
	34		2	
	<hr/>			
	544	or 25 s. 19:21 of a s.		

If 8 Pioneers 3:5 of a day do make 22 Rods of Baricado, what will they make in 7 days?

If

3
If 3:5 of a Day
make 22:1 of a Wall,
What 7:1 of a Day?
770

122 Rods Rod.
77 (256 2:3
333

If 12 hundred 3:7 of Allum cost 15 pounds 1:3 li. what will 324, 1:8 of a hundred cost? Reduce the whole and broken numbers into broken, and work as is before taught.

12 2:7 15 13 324 1:8
7 3 8

87 : 7 46 : 3 2593 :: 8

If 2088 18
cost 87:7 2083
what 46:3 208724 1.
2593:8 834946 (399 1414
834946 208888
2192

If 7:9 of an ell cost 18:11 of a pound,
what will 15:13 of an ell cost? 1 pound,
1 shilling, 6 pence, 3:4 fere.

Example.

1001		72
7: 9	77	15
8: 11	13	<hr/>
15: 13	<hr/>	360
1080	231	72
	77	<hr/>
	<hr/>	1080
1001		

79 l. l.
~~1080~~ (1 79:1101
~~1080~~

1 l. 1 s. 7 d. fere.

If 3:4 of a yard of Velvet cost 7:8 of a
pound, what will 28 yards cost? 32 l. 13 s.
4 d.

Example.

Example.

$$\begin{array}{r}
 24 \\
 3:4 \\
 7:8 \\
 28:1 \\
 784 \\
 \hline
 \end{array}
 \qquad
 \begin{array}{r}
 28 \\
 28 \\
 \hline
 224 \\
 56 \\
 \hline
 784
 \end{array}$$

$$\begin{array}{r}
 1 \\
 166 \quad l. \\
 78 * (32 \quad 2:3 \text{ of a pound.} \\
 244 \\
 x
 \end{array}$$

If 3 ells 1:8 cost 5:7 of a pound, what will the whole piece cost, containing 28 ells 1:2 at that rate? Answer.

$$\begin{array}{r}
 350 \\
 25:8 \\
 5:7 \\
 57:2 \\
 2280 \\
 \hline
 \end{array}
 \qquad
 \begin{array}{r}
 1 \\
 2280 \quad l. \\
 384 \\
 \hline
 \end{array}
 \qquad
 \begin{array}{r}
 6 \\
 18:35 \\
 \hline
 \end{array}$$

or 10 s. 3 d. 3:7 of 1 d.

If 12 pound 4 ounces of Quichanella cost 4 pounds 3 shillings 4 pence, how much will 100 pound buy me at that rate? If 49:4 of a pound cost 25:6 of a pound sterling, what will 600:6 parts of a pound buy? Answer.

600

If 25:6 of a pound	5x	1.
buy 49:4 of a pound	276400	(264
what 600:6 of a pound	66640	
176400		

The proof of this last example. If 100 pounds sterling buy me 294 pound of Quichanella, how much shall 4 pounds 3 shillings 4 pence buy me? To find the value of the hundred, the rate of one pound being given, abate two places from 294, and it will be 2 pounds 94: 100 parts of one pound: which multiply by 4 pounds, 1:6, makes 12 pounds, 25: 100 parts, or one fourth for the proof.

1. 12		2. 1:2
2. 94		11:76
4 1:6	294 (49	49
<hr/>	66	<hr/>
1176		12 25

H

* If 30 men cast a Trench in 3 days 2:3, how many men would cast it in 5:6 of a day? here by comparing these proportions together, I find that 5:6 the third number, will desire a greater quantity of men to perform the work then 11:3 of a day will require; wherefore this proportion is reciprocal or backward: wherefore I multiply the two former numbers together, makes 330:3, or in smaller terms, 110:1, which divided by 5:6 makes 660:5; which divide by the denominator 5, makes 132 men.

330	660	11	Men
11:3	110:1	660	(132
30:1	5:6	555	
3	5		

In the backward Rule, or Convert in fractions, multiply the Denominator of your third number by the Numerators of both your other numbers for Dividend; then multiply the Numerator of your third number by the Denominators of your other two numbers for Divisor, and then work as before.

Example

Example

1980

If 11:3 of a day	43	Men.
give 30:1 men	4980	(132
what 5:6 of a day	2555	
15	22	

If when the bushel of Wheat was sold for 4 shillings, the penny loaf weighed six ounces, 1:2, what shall the same loaf weigh when Wheat is sold for 2 shillings 8 pence the bushel? Multiply 48 by 13 makes your Dividend 624, then 2 by 32 makes 64 for your Divisor; and then divide 624 by 64 makes 9 ounces, 43:64, or 3:4 of an ounce.

624

If 48:1 pence	48	Ounces.
gives 13:2 ounces	624	(9 3:4
what 32:1 pence.	64	
64		

If when one ounce of sterling silver was worth 1:4 of a pound, the penny of silver weighed 30 grains; what shall the same penny weigh when the ounce shall be worth 1:3 of a pound?

Example.

Example.

90

If 1:4 of a pound
give 30 : 1 grains,
what 1:3 of a pound

xx Grains.
90 (22 1:2
44

4

If when a load of Hay was sold for 24 shillings 8 pence, the penny bottle weighed 3 pounds 1:4, what shall it weigh now the load is sold for 37 shillings? Answer, 2 pound 71:76 of a pound.

1040

If 80:3 shillings
give 13:4 pound
what 37:1 shillings
444

152 li. li.
8040 (2 71:76
444

If 3 yards 1:8 cost 9 shillings 9 pence, what will 380 yards cost at that rate? Reduce 3 yards 1:8 into eighths, makes 25:8, then reduce 380 yards into eighths, makes 3040:8 parts; then 9s. 9d. into pence, makes 117 pence; by which multiply 3040 makes 355680, which divided by 25 makes 14227 pence, 5:25 of one penny, in

in the whole 59 pounds, 5 shillings 7 pence,
5:25 or 1:5 of a penny. Behold the
work.

yard.	s.	d.	
3 1.8	9	9	380
8	12		8
<hr/>	<hr/>	<hr/>	<hr/>
25	117		3040
			117
			<hr/>
ss ss	d.		21280
ssssss (14227 $\frac{1}{2}$)			3040
ssssss			3040
xxxx			<hr/>
			355680

1 d.	l.	d.	s.	d.
289	59	2	19	or
ssssss			5	71:5
ssssss				
xx				

The proof of the former work. If 380
yards cost 59 pounds, 5 shillings, 7 pence,
5:25 of one penny, what will 3 yards 1.8
cost at that rate? Reduce your coyn into
25, makes 355680; then reduce your 380
yards into 8, makes 3040; by which di-
vide

vide
penc

1.
7
28
355

I
mon
Car
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mul
you
ther
will
mon
And
bers
into

in Fractions.

20 $\frac{3}{4}$

vide 144227 pence, makes 9 shillings, 9 pence, as before.

14227	59	5	7	5:25
25	20			
71140	1185			
28454	12			
355680	2377			
	1185			

	14227			
3x	d.			
7x2	9	s.	d.	
355680	(157	(9	9	
355680	52			
355680				
355680				

If 34 Ship Carpenters build a Ship in 8 moneths 3 : 5, in how long time will 120 Carpenters build the same? Reduce 8 moneths 3:5 into fifths, make 43:5; then multiply 34 by 43, makes 1462. Also put your Divisor 120 into fifths, makes 600:5; then dividing 1462 by 600, the quotient will be 2 moneths 262 : 600 parts of one ²⁶²moneth, or in smallest terms 131:300 parts. ⁶⁰⁰And this rule is general: if one of your numbers be a Fraction, put always your Divisor into the same Fraction of your Dividend, and

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and the quotient will be of the same denomination of your Dividend, and so the answer was moneths, and parts of a moneth.

If 34 Carpenters ask 43:5 moneths, what 600:5 moneths?

$$\begin{array}{r}
 34 \\
 \times 43 \\
 \hline
 102 \\
 136 \\
 \hline
 1462
 \end{array}$$

2 *moneths. moneth.*

~~1462~~ (2) 131:300

600

1462
moneths. *dayes.* *of a day.*
 makes 2 12 68:300

If 100 /. in 12 moneths gain 10 /. what will 336 /. gain in 8 moneths? Take the tenth part of 336, which is 33 l. 6 primes, or 12 s. makes 369 l. 12.

Secondly, If 12 moneths gain 33 pounds 6 primes; what will 8 moneths gain? I answer, less then 33 l. 6 primes; wherefore multiply by 8, and divide by the greater extreme 12, makes 22 pounds, 4 primes, or 8 shillings, the answer.

If 120 Pioneers in 6 days cast 300 rods of Trench, how many shall 600 men cast up in 4 days? If 120 give 30, what will 600 give? Answer, 1500 Rods.

Secondly,

Secondly, If 6 days give 1500 rods, how many will 4 days give? I answer, less: multiply by 4, and divide by 6, makes 1000 rods.

If 112 pounds in 12 moneths gain 100 l. what will 340 l. gain in 7 moneths? Answer, 303 l. 4 s. 7 d.

Secondly, If 12 moneths gain 303 l. 4 s. 7 d. what will 7 moneths gain?

Example.

12	2125	8497	l.
7	7	84875	117 11 : 1
84	14875	88	

A general Rule.

Put always your Divisor into the same Fraction of your Dividend, and your quotient will be of the same denomination that your Dividend was, as in the last example, 12 moneths was turned into sevenths, and also 303 l. 4 s. 7 d. was turned into sevenths of pounds, and so the quotient of that division was pounds, and the fraction of a pound remaining.

If 7 pounds in 13 moneths gain 3 l. in how long time will 340 pounds gain 60 l? First, if 7 l. gain 3 pounds, what will 340 pounds

206 *The double Rule of Three.*

pound gain, makes 145 pounds, 5:7 of a pound. 2. If 145 pound 5. 7, or 1020.7 ask 13 moneths, what will 60 pounds, or 420.7 gain? Multiply by 13, and divide by 1020, makes 5 moneths, 67 of a moneth.

If 600 great Horses in 5 days do spend 1125 bushels of Oats, how many bushels will serve 1400 Horses for 22 days? First say, if 600 give 1125, what 1400, makes 2625 bushels. 2. If 5 spend 2625 bushels, what will 22 days spend? Multiply by 22, and divide by 3, makes 11550 bushels.

How to work the double Rule at one operation.

This last question, or any other of like nature, which is wrought by the double Rule at two several operations, may be answered at one in this manner: Multiply the three latter numbers to make your dividend one into the other; then multiply the two former numbers for to make your Divisor, and then divide the dividend by the Divisor, and the quotient will be the same, as in the last example, 1125 being multiplied by 1400, makes 1575000, which again multiplied by 22, makes your dividend 3465000. Then multiply your two former numbers 600 by 5, makes 3000 for the divisor; and then dividing your dividend by your divisor

The double Rule of Three. 207

Divisor 300, the quotient will be 11550 bushels, as before at two operations.

Example.

1125
1400

4500	600
1125	5
157500	3000

22

3150
3150

34650000

Bushels.

34650000 (11550
3333000

If 35 s. in 7 moneths gain 6 s. in how long time will 340 l. gain 100 l. First, if 35 s. gain 6 s. what will 340 l. require? Reduce 340 l. into shillings, and multiply by 6, makes 40800, which divided by 35, makes 1165 s. 5:7. Secondly, If 1165 s. 5:7 require 7 moneths, what will 100 l. require? Makes 12 months, 8:816 parts of a month.

Fellowship without Time.

This Rule differeth very little from the
L Rule

Rule of Three; for in this Rule the sum of all the monies disbursed, is the first number in the Golden Rule. Then the gains or loss is the second number: the third number is each several Partners mony disbursed: so that the Rule must be severally wrought for each several Partners portions.

Example.

Four Merchants made a Company together; the first, *viz.* A. put in stock 74 l. B. put in 90 l. C. put in 100 l. and D. put in 120 l. and they found that they had gained 84 l. Now the question is, what each man must have of the gains, according to the proportion of his money disbursed? First, add all the monies disbursed into one total sum, *viz.* 74, 90, 100, 120. Total is 384 for the first number in the Golden Rule. Then the second number is 84 pounds the gains; and the third number is each particular mans stock: then work as followeth.

Example.

If 384 pounds gain 84 pounds, what will A.B.C.D. sums gain to them?

A.	74	16	.72
B.	99	19.	264
C.	100	21.	366
D.	120	26.	96
2			

The proof 384. 84 ~~788~~ (2
784

The like reason is in loss as in gains. Example: A certain ship being in a tempest on the sea, was forced to cast over-board so much of her lading as amounted unto the sum of 642 *l.* then there is great reason that all the Venturers should bear part of that loss, according to the proportion of his stock which he ventured. As suppose, *A.* ventured 700*l.* *B.* 530*l.* *C.* 640*l.* *D.* 800*l.* total is 2670. Then say, If 2670*l.* lose 642 *l.* what will each of *A. B. C. D.* lose? as in the example following.

Example.

If 2670 pounds lose 642 pounds, what will *A. B. C. D.* sums lose to them?

A.	700	168.	84
B.	530	127.	117 267
C.	640	153.	237
D.	800	196.	96
2			

The proof. 2673 642 ~~834~~ (2
767

Four Merchants bought a Ship, which cost them 3600*l.* whereof *A* must pay one third part of the money, *B* one fourth, *C* one fifth, *D* one sixth: the question is, what each man must pay of the said sum? *Answer*, Seek a number wherein the like parts may be had, which is 60, and take the like parts of that number for the numbers that you seek, for to find each mans portion of the money which he should pay. First 1:3 of 60 is 20, the 1:4 is 15, the 1:5 is 12, the 1:6 is 10, which added into one total, makes 57 for the first number in the Golden Rule.

Example.

Of 60

1:3 is 20

1:4 is 15

1:5 is 12

1:6 is 10

Total is 57

If 57 be 3600, what will be the sums of *A.B.C.D*?

A.	20	1263	9
B.	15	947	21
C.	12	757	51
D.	10	631	33

		2	

The Proof. 57 3600 | 24 (2
 57

The said Ship made a voyage to Sea, and hath gotten all charges deducted out 240 l.

the question is, what each man must have of the gains ?

Answer.

If 57 gain 240, what will *A.B.C.D.* sums gain to them?

A.	20	84	12	57
B.	15	63	9	
C.	12	50	30	
D.	10	42	6	

The proof.

	57		240			57	(I
						57	

Four Merchants made a Company, **A** put in **320** pounds, **13** shillings, **6** pence, **B** put in **840** pounds, **16** shillings, **6** pence, **C** put in **560** pounds, **18** shillings, **9** pence; **D** put **1000** pounds; and in one year they found they had gained **400**l. **18**s. **6**d. the question is, what each man must have of the gains? First, the total sum of all their monies makes **272** pounds, **8** shillings **6** pence, or **653142** pence, for the first number. Then reduce each several mans money disbursed into pence for the third number, the second is the gains also reduced into pence, and then work according to the Rule.

Example.

If 2721 pounds, 8 shillings, 6 pence gain

L 3

400

400 pounds, 18 shillings, 6 pence, what will *A. B. C. D.* sums gain to them?

	<i>d.</i>		<i>li.</i>	<i>s.</i>	<i>d.</i>
<i>A.</i>	76931	makes	57	2	1
<i>B.</i>	201798	makes	123	17	3
<i>C.</i>	164525	makes	82	12	9
<i>D.</i>	240000	makes	147	6	5

The proof.

400 18 6

*Rules of Fellowship with diversity
of Time.*

Multiply each mans money disbursed by the time that it continued in stock, and gather the totals as in the last Rule, to make the first term in the Golden Rule, and the gains or loss is the second, and then each mans product of money, and time for the third term in the Golden Rule, and work as followeth.

Example.

Three men make a stock, *A. B.* and *C.* and in long continuance of time, by dangerous adventures, they gained and got by prizes taken at Sea, 2345 pounds; *A.* put in stock 40 pounds 14 moneths, *B.* put in 50 pounds 8 moneth, *C.* put in 85 pounds 6 moneths, what will each man have of this gains?

Example.

Examples

<i>l. months.</i>	<i>l. months.</i>	<i>l. months.</i>
A. 40 14	B. 50 8	C. 85 6
14	8	6
<hr/>		
560	400	510

If 1470 pounds gain 2345 pounds, what will A.B.C. sums gain them?

A.	560	893	7	
B.	400	638	2	21
C.	510	813	12	
		I		

1470 2345	21 (1
-------------	-------

21

The second question with more diversity of time; Four Merchants made a Company. A. put in 340 *l.* 19 *s.* 2 *d.* for 10 moneths, B. put in 930 *l.* for 9 moneths. C. put in 760 *l.* for 12 moneths. D. put in 583 *l.* 33 *s.* 4 *d.* for 5 moneths, wherewith they gained 740 *l.* Now the question is, to know what each man must have of this gain?

L 4.

Example:

Example.

	li.	s.	d.	moneths.
A	340	19	2	10
	20			

6819

12 d.

13640

6819

81830

10 moneths.

818300

B 930 l. 9 moneths

9

8370

240

334800

16740

2008800 pence.

C 760 li. 12 moneths.

240

30400

1520

112400

12 moneths.

218800

D 583

Fellowship with Time.

215

D. 583 li. 13s. 4d. 5 moneths.

20

11673

12

23350

11673

14080

5 moneths.

700400

A. 8183 00

B. 2008 00

C. 21888 00

D. 7004 00

5716300

Cut off two cyphers from each number, and then work as followeth.

If 57163 pence gain 1776 pence, what will A.B.C.D. sums gain them?

		l.	s.	d.	d.
A.	8183	105	18	7	4:5
B.	20088	260	00	11	3:5
C.	21888	283	6	11	4:5
D.	7004	90	13	4	4:5
			3	3	

The proof | 57163 | 740 | 00 | 0 | 15:55

5 (33

L 5

Example

Example.

There is a booty or spoil taken by 3 men worth 785 l pound, and they agree to divide it in this sort; *A* is to have one half, *B* one third, *C* one fourth, what is each mans share?

To work this quest. and all other of like nature, seek a number which may be divided by all the denominators of your 3 fractions in whole numbers, and the smaller such a number be that you chuse, the more easie will your work be; which for to find, multiply your denominators of your Fractions one into another, that is to say, 2 by 3 makes 6, and 6 by 4 makes 24, so 12, one half of 24, will be evenly divided by all the 3 denominators, 2, 3, and 4 Wherefore I take 1: 2 of 12 is 6, and 1: 3 of 12 is 4, and 1: 4 of 12 is 3, which added into one sum, makes 13 for the first number in the Golden Rule; the second is 785 l pounds, and the third numbers are each severall mans portion imagined to be, viz. 6 4: 3 and then work as before.

If 13 give 785 l pounds, what will *A. B. C.* sums give?

		17.			
A	6	3623.	7		
B	4	2415.	9		13
C	3	1811.	10		
		2			

The proof, 13 785 l 26 (2
13

Example.

Example.

Four Merchants bought a House together which cost 3000 pound; *A* was to pay 1. 2. and 6 pounds over-plus; *B* 1:3 and 12 l. more; *C* 8 pounds less then 2. 3; *D* 1. 4 with 20 pounds over-plus. Now the question is, what each Merchant must pay for his sum? Ansv. First, The pounds over-plus must be subtracted from the sum given; and the pounds wanting must be added to the sum given; as for *A* 6 pounds, for *B* 12 pounds, for *D* 20 pounds, Total is 38 pounds to be subtracted; then for *C* add 8 pounds, therefore subtract 30 pounds from 3000 pounds, there will remain 2970 pounds; then work by the rule of Fellowship, taking 12 for a number; which will be divided by all the Denominators, 2, 3, and 4, viz. take for *A* 6, for *B* 4, for *C* 8, for *D* 3. Total is 21 for Divisor, the second number is 2970 pounds; the third, each mans part imagined.

Example.

If 21 give 2970 pounds, what will *A. B. C. D.* sum give?

A.

A.	6	848	4:7	854	4
B.	4	565	5:7	577	5
C.	8	1131	3:7	1123	3
D.	3	424	2:7	444	2
		2		2	
<hr/>					
	21	2970	14(2	3000	14(2

The proof.

7

7

The numbers found to A are 848 pound 4:7, to which if you add six pounds, makes 854 pounds 4:7.

To B 565 pounds, to which 12 pounds added, makes 577 pounds, 5:7.

To C. 1131 pounds, 3:7, from which subtract 8, leaves 1123 pounds, 3:7.

To D 424 pounds, 2:7, to which add 20 pounds, makes 444 pounds, 2:7, the which added into one total, makes 3000 pounds, the proof.

And in this manner may infinite variety of questions be propounded, and their doubts easily resolved. And here will I end concerning this Rule, and go in hand with some pleasant questions to be wrought by Position, which is the most excellent Rule of all others in Arithmetick, as shall appear in the second part of this Book in Decimal Arithmetick.

Position

Position.

*The Rule of Position, requiring one number
to be imagined before the principal
Proportion be found.*

TO work by this Rule, take any number at pleasure which you shall imagine to be the true number sought, and proceed with it, as if it were the true number, wherein if you have failed, by doubling or tripling, according to the nature of the question, you shall then attain unto the true number desired, by the aid of the Golden Rule, in manner following: For look what proportion is between the false conclusion and the false position, such proportion hath the given number to the number sought.

Example.

A. B. and C. consent to buy a Ship, which will cost them 2700 pounds, so that B. must pay twice so much as A, and C must pay 4 times so much as B, the question is, what each man must pay of this sum? I suppose A. must pay 8 pounds, then B must pay twice as much as A. which is 16 li. then C must pay 64 li. which is 4 times as much as B; but yet 8 pounds, 16 pounds, & 64 pounds,
is

is but 88 pounds, and it should be 2700 pounds, so that now I resort to the Golden Rule, and work as followeth. If 88 pounds come of my position 8 pound, of what comes 2700? Multiply 2700 by 8, and the divide by 88, makes 245 pounds, 40.88, or 5.12 of a pound for the part that *A* must pay; then *B* must pay 490 pounds, 40:11 of a pound, which is twice as much as *A*; and *C* must pay 1960 pounds, 40:11 of a pound, which is 4 times as much as *B*. The total sum is 2700 pounds. Behold, work as followeth.

If 81 pounds come of 8 pounds, of what comes 2700?

$$\begin{array}{r}
 \cancel{44} \\
 \cancel{40}88 \\
 \times 2700 \\
 \hline
 8888 \\
 88
 \end{array}
 \quad
 \begin{array}{r}
 1. \\
 (245 \quad 40.88, \text{ or } 5.11
 \end{array}$$

2 Example.

$$\begin{array}{r}
 2700 \\
 8 \\
 \hline
 21600
 \end{array}$$

A Captain of a Band of Men being asked, what number of Souldiers were in his Band, answered, I do not readily know; yet(quoth he) of this I am certain, that the 1:2, and 2:3, and 4:5, and 1:6 of their number added together into one sum, are 384 men:

men: Now the question is, what sum of men he had in his Band? I suppose he had 60 men, or 30 men in his Band, but the least number is best, viz: 30, whereof 1:2 is 15, and 2:3 is 20, and 4:5 is 24, also 1:6 is 5, their total is but 64 men, but that should be 384 men. Then say by the Golden Rule as followeth:

If 64 come of 30, of what number comes 384?

384	810	men.
30	11520	(180
11520	6444	66

Answer: He had 180 men in his Band; whereof

1:2 is 90 men,
 2:3 is 100,
 4:5 is 144,
 1:6 is 30.

Total is 384 men.

The solution of this question another way more brief.

Divide 384 by 64, makes 6; which multiply by 30, makes 180 men as before.

3 Example.

A certain man having spent 120 pounds, had

had yet remaining 1:2 and 1:3 of his whole substance? the question is, what his substance was? Answer, First 1:2 and 1:3 is 5:6, which being taken from 6:6, the whole substance, leaves remaining 1:6; therefore if 1:6 be 40 /. what is 6:6? Makes 240 pounds.

li.

40

6

240

4 *Example.*

A Merchant bought 384 yards of Broad-cloth of several prices, of each a like quantity, and he was to pay half as much more for the second sort as he paid for the first, and twice as much for the third sort as he paid for the second: Now the question is, what each sort cost him, and at what price every yard was rated unto him? I suppose the first sort cost him 4 pounds, then the second sort must cost him 6 pounds, which is half as much more as the first; and then the third costs him 12 pounds, which is twice as much as the second: the total is but 22 pounds, but it should be 248 pounds; wherefore if 22 pounds come to 4 pounds, of what number comes 248 pounds?

Example.

Double Position.

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Example.

31		248 li.
992 (45	1:11	4
xxx		<hr/>
x		992

The first cost him 35 pounds, 1.11 of a pound, then the second sort cost 67 pounds, 7:11 of a pound; the third sort cost 135 li. 3:11 of a pound, Total is 248 pounds; then divide 384 by 3, and you shall find he had 128 yards of each sort, and by practice you shall find the first sort cost 7 shillings. 1.2 d. a yard, the second sort cost 10 shillings 7 pence a yard almost; the third sort cost 21 shillings 1 penney, 1:2 d.

Double Position.

The Rule of Double Position.

Suppose a number at pleasure, as in the last Rule of *single Position*, and proceed as if you have found the right number; and if by working you find the true number, then your Position was the right number, which doth seldom happen. First, if by your working there cometh out more then the true number.

ber, then note it thus $+$ with a cross; if less, then thus $-$ with a long line, which doth signifie less.

Secondly, Suppose another number greater or smaller, and work as before, until you do find the true number sought; which if you do not find, see the difference also from the true number sought, and note it with the sign $+$ or $-$ as it shall be found.

Then thirdly, set your positions with their errors, more or less, as in the examples following.

Fourthly, Multiply cross the first position by the second error, and the second position by the error of the first, and then if the signs be both alike $+$ or $-$ abate the lesser from the greater, and the remains shall be the Divided. Also the lesser error abated from the greater, leaves the Divisor; but if the signs be contrary, one $+$ the other less, add both together to make the Dividend, and add the two errors to make the Divisor: and lastly, divide the Dividend by the Divisor, and the quotient is the true number desired.

I Example.

A certain man seeing a Purse in his friends hand, saith unto him, It seemeth unto me that there is 100 Crowns in your Purse.

purse. To whom the other answered : Nay, quoth he, there are not 100 crowns; but (saith he) if they were increased 1:2, and 1:3, and 1:4, and lastly, one Crown overplus, then would they be just 100 Crowns.

I suppose there were 12 Crowns in his purse, to which I add one half of 12, which is 6; and one third of 12, which is 4; and one fourth of 12 which is 3; and lastly one Crown more, the total will be but 26 Crowns, but they should be 100 Crowns, so that this error is too little by 74 Crowns, which I note thus :

$$74 \text{ ————— } 12$$

Secondly, I suppose he had 24 Crowns, to which I add 1:2 of 24, which is 12, and 1:3 which is 8, and 1:4, which is 6; and lastly, one Crown overplus, the total is 51, but it should be 100 Crowns, so that this is an error of 49 too little, which I note thus :

$$49 \text{ ————— } 24$$

588	74	49
748	12	24
49	24	12
1776	296	98
588	148	49
1188	1176	588
74	13	
49	1188 (47	13:25
25	255	2

The answer is, That he had 47 pounds, 13 : 25 parts of a pound in his purse. The proof followeth.

1:2 of 47	13:25 of a li.	is 13:19	
1:3 is		15:21	25
1:4 is		11:12	
and one crown overplus is		1:00	
		47:13	

2 Example.

Twenty yards of Sattin, and 12 shillings, is equal unto 13 yards of Velvet less 10 shillings; the price of either sort is required.

To answer this, or any other like question, take any number for the price of a yard of

Double Position.

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of the lesser number, which here is Velvet, which at 20 shillings a yard, lesse 10 shillings, amounteth unto 230 shillings. Now admit a yard of Sattin at 14 shillings, so 20 yards and 2 shillings amounteth unto 292 shillings; from which subtract 230 s. rests 62 shillings more then the truth. Again, rate a yard at 12 shillings, so the 20 yards and 12 shillings, makes 252 shillings; from which take 230 shillings, rests 22 s. more then truth also. Now multiplying 22 by 14, and 62 by 12, the products are 308, and 744, and the difference of those numbers is 436, then take 22 from 62, rests 40 for divisor; by which divide the difference, makes 10 shillings, 9:10 shillings, for the price of a yard of Sattin.

Example.

22	12		
14			
<hr/>		124	
88			
22	62		
<hr/>			
308	744		
	308		
<hr/>			
436			

	<i>Difference.</i>	
2	{ 14 - 62 }	<i>Divisor.</i>
	{ 12 - 22 }	40

436	s.		s.
440	(10	9:10	

3 Example.

3 Example.

Otherwise if 40, the difference of errors gain 2, the difference of positions, then 62 the first error yeilds 3 and 1:10.

Or if 40 yeild 2, what 22? makes 1 and 1:10; this taken from 12, or 3 1:10 from 14, leaves 10, 9:10 for the price as before.

4 Example.

A Carpenter was hired to work 20 days at 12 pence a day; but every day that he was idle, he was to abate 18 pence of his wages, and in the end he received but 8 shillings: Now the question is, how many days he wrought?

First, suppose he wrought 12 days, which cometh to 12 shillings, then must the 8 days that he played, come to 12 shillings at 18 pence a day also: but this question saith, there came due to him 8 shillings. Behold an error of 8 shillings too little.

Again I say, that he wrought 14 days, amounting to 14 shillings: the 6 days that he played at 18 pence a day, cometh to 9 s. this taken from 14 shillings, leaves 5 shillings, and it should be 8 shillings; which is an error of 3 shillings too little. Now multiply 12 by 3, and 14 by 8, the products

Double Position.

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are 36, and 112, and the excess is 76; which being divided by 5, the difference of the error quoteth out 15 1:1 for the number of working days, and 4 days 4:5 for the number of playing days.

$$\begin{array}{r} 12 \text{ --- } 8 \\ 14 \quad \quad 3 \end{array} \left. \vphantom{\begin{array}{r} 12 \\ 14 \end{array}} \right\} 5$$

Otherways.

If 5, the difference of errors, yield 2, the difference of Positions, what 8 the first error makes 3, 1:5 to be added to 12.

Or if 5 be 2, what is 3? makes 1, 1:5 to be added to the second Position 14, whereby all three ways, the number of the days he wrought are found out.

Barter or Exchange.

TWO men barter, one hath Ginger of 10 pence a pound ready money, and in barter he will sell it for 12 pence a pound. The other hath Sugar of 12 pence a pound ready money, but in barter he will sell it for 14 pence a pound: the question is, how much Sugar will pay for 756 pounds of Ginger?

First

First, Put your price of your Ginger into pence, makes 9072 pence, which divide by 14 *d.* makes 648 pounds of Sugar, which must be given for 756 pounds of Ginger, at 12 pence the pound.

2 Example.

Two Merchants will Barter, one hath Raisins of 34 *s.* the hundred, ready money, and in Barter he will sell them for 40 shillings: the other hath Nutmegs of 40 *s.* the pound ready money, how shall he set his Nutmegs to make the like profit? Put your coyn into pence, and say, if 408 pence be 480 *d.* what is 48 *d.*? Multiply 480 by 48, and divide by 408, makes 56 *d.* 24:51 of one penny for the price of the Nutmegs, viz. 4 *s.* 8. *d.* 1:2 of a penny

3 Example.

Two Merchants will Barter, one hath Holland of 2 *s.* 7 *d.* the ell ready money, which he will sell in Barter for 2 shillings 10 pence the ell, and yet he will gain privately 10 pound in 100 pound over that gain: at what price must he then sell his Holland? Answer, set down 2 shillings 10 pence in pence, makes 34 pence; of which take the tenth part, which is 3 pence 4:10, or 2:5, and add

add to 34 pence, makes 37 pence, 2: 5 of a penny for the price to sell one ell to make that gains. Now the other Merchant hath Wool at 7s. a Tod ready money, how shall he sell his Wool to make like profit, that he be not deceived in the bargain? If 31 pence be 37 pence, 2: 5, what is 48 pence Multiply 374 primes by 84 makes 31416; which divide by 31, makes 101 pence, 3: 10 penny, or 8 shillings, 5 pence 3: 10 of one penny, which is the price for him to sell his Wool to make like profit.

Example.

$\begin{array}{r} 34 \\ 34 \\ \hline 374 \end{array}$	$\begin{array}{r} \text{I} \\ 374 \mid \\ 84 \\ \hline 1496 \\ 2992 \\ \hline 31416 \end{array}$
---	--

$\frac{374}{31} = 101.3:10$ of one penny.
 333

4 Example.

Two Merchants will Barter, one hath Sugar
M
gar

gill of 6 pound 4 shillings ready money, and he will sell it for 7 pound the hundred. The other hath Ginger of 4 pound 6 shillings the hundred, and in barter he will sell it for 5 *li.* the hundred; now the question is, at what rate each of them doth gain *per cent.* and which hath the advantage of the other.

First, if 6 pounds 2 primes gain 8 primes, what will 100 *l.* gain? Multiply 8 primes by 100, makes 800 primes; then add 2 or 3 cyphers more to it, which divide by 6:2 primes, makes 12 *l.* 9 primes, 10:31 of a prime, or near 12 *l.* 18 *s.* which the first man doth gain *per cent.*

Secondly, if 4 *l.* 3 primes gain 7 primes, what will 100 *l.* gain? Multiply 7 primes by 100, and add 2 cyphers more, makes 70000, which divide by 4:3 primes, makes 16 pound, 2 primes, 34:43 of a prime; from which subtract 12 pound, 18 shillings, 8 pence, rests 3 pound, 7 shillings, 7 pence, which the second man hath gained more then the first gained.

5 Example.

Two Merchants barter, one hath a certain number of pieces of Sattins at 18 *s.* a piece, for the which the other doth give him 1806 ells of linnen cloth, at 16 pence the

Barter or Exchange.

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the ell, and yet 30 *li.* in ready money ; the question is, how many pieces of Sattin he had ? First, find what 1806 ells of linnen cloth cost by praetice ; makes 120 *l.* 8 *s.* to the which add 30 *li.* makes 105 *l.* 8 *s.* then divide 150 *l.* 4 primes, by 18 *s.* or 9 primes make 169 pieces of Sattin, and 1 : 9 of a piece.

Example.

$$\begin{array}{r}
 3 \text{ li. } | \\
 1806 \text{ (120 } 4 \\
 15555 \text{ 30} \\
 \hline
 681 \text{ 150 } 4 \\
 1555 \text{ Pieces Piece.} \\
 999
 \end{array}$$

6 Example.

Two men will barter, one hath Pepper of 22 pence the pound ready money, but in barter he will sell it for 27 pence the pound: the other hath Cinnamon of 3 shillings 6 pence the pound ready money, and in barter he will sell it 4 shillings the pound : the question is, how much Cinnamon will pay for 384 pound of Pepper at that rate ? First,

M 2

384

234 *Barter or Exchange.*

384 pound of Pepper at 27 d. the pound is 43 l. 4 s. which divide 864 s. by 4 s. makes 216 pound Cinnamon, which he must give.

7 *Example.*

If 4 English ells makes 5 yards, and 13 yards makes 50 Pawns at *Geans*, how many Pawns is in 100 ells English? If 5 be 4, what is 13, makes 10, 2:5. Secondly, if 10, 2:5 be 50, what is 100, 480, 0:13.

8 *Example.*

Every 4 ells at *Antwerp* maketh 5 at *Frankeford*, and 25 there makes 24 Braces at *Luques*: the question is how many Braces in 100 in *Antwerp*? If 25 be 24, what is 5? makes 4, 4:5. Secondly, if 4 be 4, 4:5, what are 100, makes 120.

9 *Example.*

If 3 yards at *London* be 4 ells at *Antwerp*, how many yards at *London* make 84 ells at *Antwerp*? If 4 be 3, what 84? makes 63 ells.

10 *Example.*

At *Roan* 112 ells make but 98, and 100 ells at *Roan* is 112 at *Sivil*, how many of ours in 100 ells of *Sivil*? If 98 *Roan* be 112 ells.

Barter or Exchange.

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ells, what 100 Roan? makes 114 ells, 1:7 of an ell. Secondly, if 112 ells be 114, 1:7, what is 100 *Sivil*? makes 102, 19:25.

11 Example.

If 67 yards at *London* be 10 in *Venice*, how many are 7894? multiply by 67, makes 5288 yards, 98:100 parts.

12 Example.

A Merchant doth deliver 400 l. sterling in *London* by exchange for *Antwerp*, at 23 s. 5 d. the pound sterling, the question is how much *Flemish* money he shall receive at *Antwerp*? Put your 23 s. 5 d. into pence, makes 281 d. which multiply by 400, makes 112400 d. which divide by 240, makes 468 l. 6 s. 8 d. which he must receive at *Antwerp*.

Example.

23 s.

5 d.

12

281

400

276

5

112400

281

2

2442 d.

3688

l. | d.

112400 (468 3 8

2444 d.

222

M 3

13 Ex

13 Example.

If 100 pound sterling be 104 *l.* 6 *s.* 4 *d.* *Flemmish*, what is one pound sterling worth? Reduce your coin, 134 *li*, 6 *s.* 4 *d.* into pence, make 32236; which divided by 100, makes 322 pence, 9:25 pence, or 26 *s.* 10 *d.* 9:25 of one penny, for one pound sterling.

If one pound sterling be 1 *l.* 12 *s.* 7 *d.* *ob.* *Flemmish*, how much sterling money is in 100 *l.* *Flemmish*? Reduce 100 *l.* into pence, makes 24000 pence; then put it into half pence, makes 48000 half pence, then put 1 *l.* 14 *s.* 7 *d.* *ob.* into half pence, makes 831; by which divide 48300, makes 57 *l.* 15 *s.* 1 *d.* almost, and so much sterling money is in 100 *l.* *Flemmish* money at that rate.

Of Gain and Loss.

IF 13 pieces of Canvas cost 17 *l.* 12 *s.* how may I sell them to gain 8 pound in the hundred? Multiply 176 by 8, makes 1:408 or 1 *l.* 8 *s.* 2 *d.* almost, and so much must he sell them for to gain 8 pound in the hundred.

If

Gain and Loss.

237

If 17 li. 12 s. gain 1 l. 8 s. 2 d. what will 100 l. gain? Multiply 1 l. 8 s. 2 d. in Decimals by 100, and divide by 17 pounds, 6 primes, makes 8 li. in the 100 the proof.

Example.

3

$$\begin{array}{r}
 17600 \\
 \dots 8 \\
 \hline
 1408
 \end{array}
 \quad
 \begin{array}{l}
 8408 \text{ (8 li.} \\
 876
 \end{array}$$

A Merchant hath lent 630 li. at interest for 10 li. in the 100 for three years, interest upon interest: the question is, unto what sum it will amount unto at the end of the term? Answer: Take the tenth part, and add it into one total 3 several times, makes 838 li. 10 s. 7 d. 1.5 of a penny, for the principal and interest, at the rate given, to be paid at the end of three years.

Example.

1 year.	2 year.	3 year.
60		76230
630	6930	76230
<hr/>	6930	<hr/>
6930		838539
	762 30	
	M 4	

Examp

2 Example.

A Merchant receiveth for principal and interest 838 £ . 10 s . 7 d . 1 : 5 of a penny at 10 $\%$ in the hundred compound interest, which was for money delivered out for 3 years; now the question is, what was the sum of money that was lent? To do this, or any other the like question, divide the sum of money received by 100, 3 several times, and the 3 quotients will shew the yearly increase of the money lent, and the last quotient will be the answer to the question, or the money disbursed, as in the Example following, which is the proof of the former question.

Example.

823	283	
838 838	(78238	(6930
22222	2222	
222	22	
3		
8838	(630 pound lent.	
2222		
2		

2 Example.

A Merchant lent 100 £ . for 7 years at 10 pound in the hundred compound Interest, the question is, what he shall receive at the end of the term,

Example.

Example.

$$\begin{array}{r} 100 | \\ 10 | 0 \end{array}$$

 one year, 100 li.

$$\begin{array}{r} 110 | 0 \\ 11 | 00 \end{array}$$

 2 years, 121 li.

$$\begin{array}{r} 121 | 00 \\ 12 | 100 \end{array}$$

 3 years, 133 li. 2 s. 0 d.

$$\begin{array}{r} 133 | 100 \\ 13 | 3100 \end{array}$$

 4 years, 156 li. 8 s. 2 d.

$$\begin{array}{r} 146 | 4100 \\ 14 | 64100 \end{array}$$

 5 years, 16 li. 1 s.

$$\begin{array}{r} 161 | 05100 \\ 16 | 105100 \end{array}$$

 6 years, 177 li. 3 s. 1 d. ob.

$$\begin{array}{r} 177 | 156100 \\ 17 | 71561 \end{array}$$

 7 years, 194 li. 17 s. 5 d.

$$19 | 871710$$

Makes at 7 years end 194 li. 17 s. 5 d.

*How to work compound Interest at any rate
per cent.*

What is the principal and interest of 352
M 5 pound

pound, put out at 8 /. in the hundred compound interest, to be paid at the end of two years? Add 2 cyphers to 352/. makes 35200; then place your interest 8 under the lowest cypher next the right hand, and multiply 352 by 8, placing the product under the line, and that will be the interest, which added unto the sum lent, makes the total of the principal and interest, and so work for the second, third, and fourth year, as in the example.

1 year.	
35200	3801600
....88
<hr/>	<hr/>
1816	304128
<hr/>	<hr/>
380 16	410 5728
or 380 li.	3 s. 2 d. or 410 l. 11 s. 5 d.

First I multiply 35200 by 8, makes 2816, which I add unto 35200, makes 38016; then I multiply 3801600 by 8, makes 410|5728, or 11 s. 5 d. abating 4 figures for the 4 cyphers which I added to the sum for to find out the prime line, as appeareth in the example; and so of any other sum or rate in the hundred.

At 17 pound the hundred per ann. compound

pound interest, what will 879 l. amount unto, to be all forborn unto the end of five years? Add 2 cyphers to your sum given, and multiply by your Interest 17, and add into the principal, and so work 5 years, and the last product will be the sum of money to be received, viz. 1927 li. 3 s. 5 d.

Example.

87900

17

6153

879

One year.

1028 | 4300

17

171 | 9001

2843

Two years.

1203 | 263100

17

1842 | 28417

203 | 2631

Three years

1407 | 81782700

17

1985 | 4724789

407 | 817827

Four years.

1647 &c.

242

Gain and Loss.

1647		1468575900
		17
15		3002800313
164		4685759
<hr/>		
1927		1618233803

Five years.

l. s. d.
1927 3 5

If a Merchant buy a parcel of Holland, at 3*l.* 6*s.* the piece; and another parcel at 4*l.* 2*s.* the piece; the third sort at 1*l.* 10*s.* the piece; the fourth sort at 5*l.* the piece; how may he sell 40 pieces, of each sort 10 pieces, to gain 18*l.* in the hundred, and give 9 moneths time for the payment? as in the example following.

Example.

10 Pieces at 3.	6 a piece	33	0
10 Pieces at 4.	2 a piece	41	0
10 Pieces at 4.	10 a piece	43	0
10 Pieces at 5.	0 a piece	50	0

The sum is, 169 0

16900

18

1352

169

199 1/4

Take

Take the 3:4 of the interest, makes 191 l . 16 s . 3 d . 3:5 of one penny, to sell to gain 18 pound in the hundred for to give 9 moneths time.

A Merchant sold 300 quarters of Wheat cost him 352 l . ready money, and lost 7 l . in the hundred; what did one quarter cost him, and at what rate did he sell a quarter to lose 7 l . in the hundred? Take the Interest at 7 l . in the hundred, which is 24 l . 12 s . 9 d 3:5, which subtract from 352 li . makes 327 pounds, 7 shillings, 2 pence 2:5 of a penny, and divide the remainder by 300, makes 1 pound 1 shilling 10 pence, for the price sold: Secondly, divide 352 pound by 300, makes 1 pound 3 shillings 5 pence *ob.* for price which it cost him.

Rye sold for 3 shillings a bushel loseth 20 pound in the hundred, what will then be lost, if it be sold for 3 shillings 6 pence a bushel? If 3 shillings be 80 l . what is 3 shillings 6 pence? multiply 80 l . by 31:2 or by 3 shillings 6 pence makes 2800; which divide by 3, makes 93 l . 1:3. Or otherwise, if 36 pence be 80 l . what is 42 pence? multiply 80 by 42, and divide by 36, makes 93 l . 1:3 of a pound, as before.

If in one ell of cloth sold for 3 shillings 2 pence, there were gained after the rate of 10 pound

10 pound in the hundred, what did that ell of cloth cost? Divide 385, or 38 penny 1:2 by 110, makes 35 pence, that the ell cost.

385 (35 d.
 1100
 11

If one yard of Holland cloth cost 2s. 11d. how many yards shall I buy for 34 l. 6s. put it into pence, makes 8232 pence; which divide by 35 d. makes 235 yards, 1:5 yard.

*How to gain any rate in the hundred
 you desire.*

Put your price, that one yard, ell, pound, or piece doth cost you, into pence; and then for 10 l. in the hundred, take the tenth part of that sum, which is the same number, placed one place nearer to the right hand, and that is the profit or interest; which added up into the price given, makes the price to sell one yard, pound, ell, or piece, to gain 10 l. in the hundred ready money.

3 Example.

If one ell of Holland cloth cost 3 shillings 9 pence, how may I sell to gain 10 li per cent.

cent. ready money? put 3*s.* 9 *d.* into pence, makes 45 pence: then take the tenth part of 45 *d.* which is 4 *d.* 5:10, or one half, makes 49 *d.* 1:2 for the price to sell an ell to gain 10 *li.* per cent.

Example.

d.		s.	makes	d.		d.		d.
45	5			4		1		1.2
4	5			74				
49				7		4	makes	6 9 2:5
81				4				

If your price you would gain be not 10 % in the hundred, then add 2 cyphers to your number of pence given, and multiply that number by your interest, omitting to multiply the cyphers, and the product under the line is your interest or gain, which added up into one sum, makes the price to sell one yard, ell, pound, or piece, to gain according to the rate desired.

Example.

If one pound of Cloves cost 4 shillings 10 pence, how may I sell to gain 9 % per cent. ready money? Put 4*s.* 10*d.* into pence, makes 58 *d.* then add 2 cyphers, makes 5800; which multiply by 9, makes 522, or 5 *d.* 22:100 parts of one penny; which added up to the upper

upper numbers, is 63*d.* 22:100 parts of one penny, or 5*s.* 3*d.* 1:5 of a penny for the price to sell one, to gain 9*l.* in the hundred.

At 9 pound in the hundred.

$$\begin{array}{r} 5800 \\ \dots 9 \\ \hline 522 \\ \hline 6322 \end{array}$$

At 12 pound in the hundred.

$$\begin{array}{r} 47|00 \\ 12 \\ \hline 94 \\ 47 \\ \hline 52|64 \end{array}$$

or 5*s.* 3*d.* 22:100.

or 4*s.* 2*d.* 16:25*d.*

If one piece of Raisins cost 18*s.* 9*d.* how may I sell to gain 18*l.* in the hundred ready money? Put your money into pence, makes 225*d.* to which add 2 cyphers, makes 22500; which multiply by 18, makes 40:50, or 40*d.* ob. which added to the price makes 265*d.* ob. for the price to sell one piece to gain 18*l.* in the hundred.

Example.

$$\begin{array}{r} 225|00 \\ \dots 18 \\ \hline 1800 \\ 22|5 \\ \hline 40|50 \end{array}$$

21

268 (22s. 1d. ob. for the price of 1 piece.

322

x

A Merchant lent wares for 10 pound in the hundred profit for 12 moneths, and at the end of 6 moneths he received principal and interest 356/. the question is, what was the sum lent? Answ. add 2 cyphers to 356 /. and divide by 105 /. which is 6 moneths interest and principal, makes 339 pound, 1:21 parts of a pound for the sum lent.

Example.

x

49

885

3800

885

800

x

li.

li.

(339

5:105, or 1:21
parts of a pound.

Interest for

$$\begin{array}{r|l} 3390 & 5 \\ 339 & 05 \end{array}$$

years.

Interest for

$$\begin{array}{r|l} 169 & 525 \end{array}$$

1:2 year.

The Proof.

$$\begin{array}{r|l} 356 & 00 \end{array}$$

Equation

Equation of payment.

The Rule of Payment is to bring divers payments due at several days, to be paid at one entire payment.

A Merchant is to pay at divers payments 600 pound, viz. 200 l. present, 200 l. at 8 moneths, 140 l. at 6 moneths, and 60 l. at 2 moneths: now he is willing to pay all at one payment; what time must be given? The ready money being omitted, set the rest as numerators thus, 200 : 600 : 140 : 600 : 60 : 600 parts, which in their last terms abbreviated, makes 1:37:30 and 1:10. Now multiply 1:3 by 8, makes 2, and 2:3; secondly, 7:30 by 6, makes 1 and 2.5; thirdly, 1.10 by 2, makes 1.5; total is 4 months, and 4.15 of a month for the time sought.

Example.

200:8 3

105:7 5

15:1 5

320 75

28

328 (4 months, 20.75

78

A Merchant hath owing him 752 l. to be paid 200 l. present, 200 l. at 3 months, 130 l. at 5 months, and the rest at 12 months;

now

Equation of payment. 249

now at what time ought this money to be paid all at one payment?

Example.

200.752	130.752	222.752
3	5	12
<hr/>		
600	650	2664
2664		
650	15 moneths.	days.
600	3914 (5	6
<hr/>		

3914

A Merchant hath owing unto him 782 £ . to be paid 1 : 3 at 4 moneths, 1 : 2 at 7 moneths, the rest at 12 moneths, what time must it be all at one payment?

Moneths.

1:3	4	1	1:3
1:2	7	3	1:2
1:6	12	2	0:0
<hr/>			
		6	5:6

Makes 6 moneths, 5:6 of a moneth.

Wines worth 14 pound ready money, are sold for 16 £ . to pay 1 : 3 at 3 moneths, 1:2 at 4 moneths, and the rest, which is 1:6 at 12 moneths; the question is, what is gained in 100 pound in 12 moneths?

Moneths

	<i>Moneths.</i>			
1:3	3	1	0:0	
1:2	4	2	0:0	
1:6	12	2	0:0	
<hr/>				
5			0:0	

Makes at 5 pound in the hundred.

Sugars worth 21 $\frac{1}{2}$ ready money, are sold for 25 $\frac{1}{2}$ to pay 1:5 ready money, 1:8 at 4 moneths, 3:10 at 7 moneths, 2:8 at 15 moneths, the question is, at what rate *per cent. per ann.* they were sold?

	<i>Moneths.</i>			
1:8	4	0	1:2	
3:10	7	2	1:10	
2:8	15	5	5:8	
<hr/>				
8			9:40	

Makes 8 pound, 9:40 *per cent.*

Allegation Medial.

Allegation is an Art teaching to combine or knit together divers things unequally prised, and thereby to find an equal price of any part of the said mixture. *Allegation Medial*

Medial is that which by the augmenting the quantity of every severall portion to be mixed by his own price, and dividing the sum of all the products by the total of the severall portions to be mixed, findeth the thing sought.

Example.

Three severall sorts of Barley are to be mixed, viz. 34 bushels at 18 *d.* and 76 at 20 *d.* and 100 at 22 *d.* the question is, what one bushel of that mixture will be worth? First multiply each number by his price, viz. 34 by 18, 79 by 20, and 100 by 22, makes 612, 1520, and 2200, the total is 4332: then add the number of bushels in the sum, makes 210; by which divide 4332 *d.* makes 20 *d.* 132 : 21 of one penny for the price of one bushel so mixed.

3 Example.

If you will mix 30 gallons of Sack at 4 *s.* a gallon, with 150 gallons of White Wine at 2 *s.* the gallon, what will a gallon of that mixture be worth? Multiply 30 by 4 makes 120 *s.* also 150 by 2, makes 300 *s.* Total is 420 *s.* then add 30 and 150 makes 180 gallons; by which divide 420 *s.* makes 2 *s.* 1:3 of a shilling, or 2 *s.* 4 *d.* for the price of one gallon so mixed.

Example.

3 Example

Admit there were 6 portions of Silver of 7 ounces fine, 12 of 8 ounces fine, and 25 of 10 ounces, which are to be mingled with 10 pound of Copper, what is a pound of that mixture worth? For answ. multiply 6 by 7, makes 42; also 12 by 8, makes 96, and 25 by 10 makes 250, the total 388; which being divided by 53, the total of 6, 12, 25, and 10, makes 7 ounces, 17. 53 of an ounce; and so much fine is a pound of that mixture.

4. Example.

A Merchant hath 6 several sorts of Spices, of which he will sell of each an equal quantity, of several prices, for the sum of 323 l. 8 s. viz. Cinnamon large at 4 s. 6 d. a pound; Nutmegs Case at 3 s. 8 d. a pound; Large maces at 8 s. a pound; and Pepper Case at 2 s. 2 d. a pound, Pepper Catlico at 22 pence the pound, and Ginger large at 10 pence a pound; the question is how many pound he must have of each to make the just sum of 323 l. 8 s.? Answer, First put your money into shillings, makes 6468 s. Secondly, put all your prices of the Spices into one sum, and by that sum, which is 21 shillings, divided 6468, makes 308 l. which he must sell of each.

Ex ample

Allegation Alternate.

253

Example.

	s.	d.
1	4	6
2	3	8
3	8	0
4	2	2
5	1	10
6	0	10

li.
 3468 (308
 2111
 28

21 00

	li.	s.	d.
1	69	6	0
2	123	4	0
3	56	9	4
4	33	7	4
5	28	4	8
6	12	16	8

323 8 0

Allegation Alternate.

ALLegation Alternate, is that, which altereth the places of such excesses as commonly fall between the mean price, and the extremes, in which counter-change, if the extremes be equal, then the difference between the mean price, and lesser extrem, is to be set against the greater extrem, and of the contrary if otherwise.

Example.

1 Example.

White Wine of 20 *d.* the gallon is to be mixed with Sack of 3 *s.* a gallon, so that there must be mixed 300 gallons to make the price to be but 2 *s.* 4 *d.* the gallon, the quest. is, how much of each sort must be taken?

The numbers set down, as in this example thus, the difference of 20 the lesser extreme from

	<i>d.</i>	
	36—	8
28	20—	8

28, is 8; also the difference of 36 the greater extreme is also 8, so that I find you must take as many of one sort as of the other, to make this mixture, viz. 150 gallons of each sort.

2 Example.

White Wine of 16 *d.* a gallon is to be mixed with Sack of 40 *d.* the gallon, how many gallons must be taken of either sort, so that 120 gallons may be of 30 pence the gallon.

The numbers being set down, as in this example, the difference of 16 the lesser extreme from 30 the mean price, there will remain 14, which I place against 40; then take the difference of 40 the greater extreme from

	40—	14
30	16—	10

Allegation Alternatē.

255

from 30 the mean price, there will rest 10 to be linked with the lesser extreme; where- by I find, that so often as I take 14 gallons of Sack, I must take 10 gallons of White Wine to make the mixture,

wherefore if 24 gal-
lons be 120, what is

$$\left\{ \begin{array}{l} 14 \mid 70 \\ 10 \mid 50 \end{array} \right.$$

Example.

A certain Clothier is desirous to mingle 144 pound of Wool of 4 sorts, viz. Blew Wool of 16 s. the stone, Red Wool of 11 s. the stone, Green Wool of 12 s. White Wool of 9 s. the stone; how many stone of each shall he take, that one stone of the mixture may be worth 14 s.

The counter-change being made according to the Rule, as in the margent, it is plain that so often as you take 5 of blew you must take 3 of green, and 2 of red, and 2 of white.

$$14 \left\{ \begin{array}{l} 16. \quad 5 \\ 12. \quad 3 \\ 11. \quad 2 \\ 9. \quad 2 \end{array} \right.$$

Therefore if 12
be 144, what is

$$\left\{ \begin{array}{l} 5. \\ 3. \\ 2. \\ 2. \end{array} \right. \begin{array}{l} 60 \\ 36 \\ 24 \\ 24 \end{array}$$

The end of the First Book.

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THE
SECOND
BOOK:

Containing a Treatise
OF
Decimal Arithmetick;

Wherein is taught how to work all
manner of Operations in *Decimal*
Arithmetick, more speedy and
easie then by *Vulgar Arithmetick*.

And first of the
DECIMAL TABLE.

L O N D O N,
Printed by J. Fleisher for Robert Horn at
the Angel in Gresham Colledge, 1670.



The use of the DECIMAL TABLE.

THe Decimal Table following doth begin from one farthing unto a prime, or 2 shillings : so that if you have a Decimal Fraction given, which doth contain 90625 sixths, search it in the Decimal Table, and you shall find it over against 21 pence, 3 farthings, and that is the value of that Fraction given.

Or if you would know how to set out 16 pence half penny in Decimals, search in the Table against 16 *d* 2 *q*. and you shall find 6875 sixths for the Decimal sought.

But if you would set out any number of shillings, from one shilling unto one pound, or 20 shillings, search in this little Table following, and you shall find your desire. As if you would set out 15 *s*. in Decimals, you shall find 7 primes, 5 seconds for 15 shillings, and so of any other sum, as in the example following.

shill. | 1:2

1	05
2	10
3	15
4	20
5	25
6	30
7	35
8	40
9	45
10	50
11	55
12	60
13	65
14	70
15	75
16	80
17	85
18	90
19	95
20	100

N 3

The

q. 1. 2. 3. 4. 5. 6. 7.	q. 1. 2. 3. 4. 5. 6. 7.
I 0 0 1 0 4 1 6	VI 0 2 5
2 0 0 2 0 8 3 3	1 0 2 6 0 1 4 6
3 0 0 3 1 2 5 0	2 0 2 7 0 8 3 3
	3 0 2 8 1 2 5
I 0 0 4 1 6 6 6	VII 0 3 9 1 6 6 6
1 0 0 5 2 0 8 3	1 0 3 0 2 0 8 3
2 0 0 6 2 5 0 0	2 0 3 1 2 5
3 0 0 7 2 2 1 6	3 0 3 2 2 9 1 6
II 0 0 8 3 3 3 3	VIII 0 3 3 3 3 3 3
I 0 0 9 3 7 5	1 0 3 4 3 7 5
2 0 1 0 4 1 6 6	2 0 3 5 4 1 6 6
3 0 1 1 4 5 8 3	3 3 4 6 4 5 8 3
III 0 1 2 5	IX 0 3 7 5
1 0 1 3 5 4 1 6	1 0 3 8 5 4 1 6
2 0 1 4 5 8 3 3	2 0 3 9 5 8 3 3
3 0 1 5 6 2 5	3 0 4 0 6 2 5
IV 0 1 6 6 6 6 6	X 0 4 1 6 6 6 6
1 0 1 7 7 0 8 2	1 0 4 2 7 0 8 2
2 0 1 8 7 5	2 0 4 3 7 5
3 0 1 9 7 9 1 6	3 0 4 4 7 9 1 6
V 0 2 0 8 3 3	XI 0 4 5 8 3 3 3
1 0 2 1 8 7 4 6	1 0 4 6 8 7 5
2 0 2 2 9 1 6 6	2 0 4 7 9 1 6 6
3 0 2 2 9 5 8 2	3 0 4 8 9 5 8 4
VI 0 2 5	XII 0 5

q.	1.2.3.4.5.6.7	q.	1.2.3.4.5.6.7
XII	0590000	XVIII	075
	10510416		10760146
	20520833		20770833
	3053125		3078125
XIII	0541666	XIX	0791666
	10552083		10802083
	205625		208125
	30572916		30822916
XIV	0583333	XX	0833333
	1059375		1084375
	20604166		20854166
	3064583		30864583
XV	06225	XXI	0875
	10635416		10885416
	20645833		20895833
	3065625		3090625
XVI	0666666	XXII	0916666
	10677082		10927082
	206875		209375
	30697916		30947916
XVII	0708333	XXIII	0958333
	10718746		1096875
	20729166		20979166
	30739582		30989584
XVIII	073	XXIV	1000000

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T H E
S E C O N D B O O K,
Containing a Treatise of
Decimal Arithmetick.

*The Declaration of the parts of the
Decimal Table.*

First, the Decimal Table in the left Margent contains certain numbers in great and small letters; first from one farthing unto one prime, or tenth of a pound, or 2 shillings. Then from one prime for every shilling unto one pound sterling, or 20 shillings. First, beginning in the left margent, is set down one farthing in the uttermost parallel to the left hand, in the first parallel of the Table, and so continuing from one farthing to 1 prime or 2 shillings: and over against every number on the left side in a right line towards the right hand is contained the numbers in Decimals, answering unto every farthing, from 1 farthing to

N 5 1 prime

1 prime or 2 shillings ; and in the upper margent in the head of the Table is contained the true Denominations of the said numbers in primes, seconds, thirds, fourths, fifths, sixths, and sevenths, which are small enough to work any question exact to a small Fraction of one penny in a sum of great value, as shall appear by examples following, But here you shall note, that all the numbers in the said Table cannot be exact and perfect.

*To find the value of a Decimal Fraction
in the parts of Coin.*

Suppose a number given to be 2 seconds, 4 thirds, 5 fourths, and 7 fifths, and you desire to know the true value thereof in Coin; set down your numbers, as in the example following, and mark your prime line, and then multiply the Fraction by 240, the pence in one pound, and the numbers that arise by Multiplication over the prime line, are the sum of pence, the value of that fraction given, and the remainder on the right hand of the prime line is the Fraction of one penny.

Exam-

Example.

$$\begin{array}{r} 1.23.4.5 \\ 02457 \\ 240 \end{array}$$

$$\begin{array}{r} 98280 \\ 4 \overline{) 914} \end{array}$$

Pence 5 | 89680 8968 : 10000 of a d.

Here by multiplication of 2457 fifts by 240 pence, I find 5 pence is gone over the prime line, and there remains 8968 : 10000 parts of one penny. Now to know the value of that fraction in farthings, multiply the same by 4, and so many as go over the prime line are farthings, the rest is the fraction of a farthing.

Example.

$$\begin{array}{r} 8968 \\ 9 \overline{) 4} \end{array}$$

$$3 \overline{) 5872}$$

Numeration in Decimals.

If you have a number to be expressed in Decimals of Money or Coin sterling, learn first, by the Decimal Table, how to express your Coin, from one penny unto one pound, sterling,

sterling, or from 1 farthing to 1 $\frac{1}{4}$ sterling, for which the Table going before was calculated. If you would know the manner how to calculate the said Table, divide one pound, adding 7 cyphers unto it, by your part you would know how to set forth in Decimals: as if you would know how a farthing will stand in Decimals, divide 1 $\frac{1}{4}$ with cyphers by 960, the number of farthings in one pound sterling, and the quotient will be the number in Decimals, signifying one farthing.

Example.

6
* * B * *
x x o o x x o 7
y y b b b b b (IO414
y y y y

So that I find, that dividing of 1 pound by 960 farthings, the quotient is 1 third, 0 fourths, 4 fifths, 1 sixth, and 6 sevenths: for if you should have proceeded, adding more cyphers, the quotient would have been always 6, because I see the number remaining to be the same it was at the last, that is, 64. And although a farthing cannot be set out exactly in Decimals, yet it will serve in *Multiplication* and *Division*: for in 10000 yards or ells, it will not differ 1 penny,

penny, as shall appear afterwards by examples in their places.

How to set out a penny in Decimals.

Divide 1 penny with cyphers by 240, the number of pence in 1 pound sterling, and the quotient will be a penny in Decimals.

2 *Example.*

$$\begin{array}{r}
 \text{xx} \\
 466 \quad 3.45.6.7 \\
 \text{xxxxxxxx} \quad (41666 \\
 \text{xxxxxxxxx} \\
 \text{xxxxx}
 \end{array}$$

Here seeing that after I find the first quotient 6, and the remainder 16, as before, I cease Division as needles any further, knowing it will produce 6 in the quotient infinitely, and therefore I put as many times 6 in the quotient as I find expedient and needful, and 1 penny stands thus;

$$\begin{array}{r}
 3.45.6.7 \\
 41666
 \end{array}$$

And these and divers other numbers will not be set exact in Decimals, but yet they will serve to great purpose and exactness in a multitude of questions, in saving an infinite labour in *Reduction, Multiplication, and Division.*

How

How to break a pound in to his exact parts.

Set down 1 pound thus, 10; then take the tenth, wick is one prime, or 2 shillings, which I note thus,

1

1

Then take half of that prime, or 2 shillings, saying, the 1 half of 10 is 5, or the one half of one prime is 5 seconds, or 1 s. then the one half of 5 seconds is 2 seconds, and 5 thirds; saying the 1 half of 5 seconds is 2 seconds, and 5 thirds, which is 6 d. then half of 2 seconds, 5 seconds is one second, 2 thirds, 5 fourths, which doth represent 3 d. in Decimals. Again, one half of 1 second, 2 thirds, 5 fourths, is 6 thirds, 2 fourths, 5 fifths, representing 1 penny half penny, or 3 half pence. Again, half of that number is 3125, or 3 thirds, 1 fourth, 2 fifths. 5 sixths, signifying 3 farthings in Decimals. Behold the work.

	2 s.	1 s.	6 d.	3 d.
1.		. 2	50	2.3 25
10	10	5	25	2 5 125
1	5			1 2 3

	Id.ob.	or 3 farthings.
125	3 4 5	625
625	6 2 5	3 1 2 9

It

It is also very necessary to understand the proportional parts of a pound, for by them are many questions speedily wrought in Decimals, as shall appear in the examples of *Multiplication* and *Division* afterwards.

How to expresse the value of any number in Decimals.

Admit for example this number following is to be expressed according to the computation of Decimal Arithmetick, viz. $3785/725$ thirds: Then for the expressing the signification of that number in the known parts of Coyn, first mark out your prime line, to distinguish the whole numbers from the Fractions with a right down stroke with the pence, and then you shall find the numbers to stand thus, 3785 $\frac{725}{1000}$. 7 primes 2 seconds, and 5 thirds; which search in your Decimal Table, and it doth signify 14 shillings 6 pence; so that the whole number is 3794 pounds, 14 shillings, 6 pence; and so of all numbers; for you shall understand that every prime doth signify in value 2 shillings, every second 2 *d.* and 2:5 parts of 1 penny, and every 5 thirds 1 penny, and 1 : 5 of one penny, or else every prime is 1:10 of 1 pound: every second 1:100 part of 1 *li.* and every third 1:1000 part of 1 pound, &c. infinite.

How

*How to remove a Decimal number from
one place to another*

If you have a Decimal number given : as for example, 3 pence, which doth thus stand in Decimals, **1** second, **2** thirds, **5** fourths ; then you desire to know how it will stand in the place of primes, pounds, or in the place of **10** l. or hundreds, or thousands ? Remove it one place toward the left hand, and it is **1** prime, **2** seconds, **5** thirds, or in known parts of Coyn **2 s. 6 d.** Again, remove them one place more towards the left hand, and it will be **1** pound **2** primes, **5** seconds, or **1** pound **5** shillings. Again, remove one place more, and it will be **12** l. **10 s.** Again, remove it one place more, and all your fractions are in whole numbers, and will signify **125** pound, &c.

2 s. 6 d.	1 l. 5 s.	12 l. 10 s.
1 2 5 0	1 2 5 0 0	1 2 5 0 0 0
l.	l.	
125 0000	1250 0000	
l.		
125 0 0000		

And this Rule is very necessary to be well and perfectly understood ; for by any price being

being given of a unite in Decimals, you may speedily know what 100, or 1000, or 10000 will cost at that rate, onely by adding of one, two, or more cyphers.

As for example, if one ell cost 6 s. 3 d. what will 100 ells cost at that rate? First, set out your price in Decimals thus, 3 primes, 1 second, 2 thirds, 5 fourths, and adding of 2 cyphers, because 100 hath 2 cyphers, the sum will be 31|2500; and because your fractions were fourths, cut off 4 figures and cyphers towards the right hand, or mark your prime line, and you shall find that 100 ells will cost 31 l. 5 s. at that rate.

1 Example.

$$\begin{array}{r|l} \text{li.} & \text{l. s. d.} \\ 31 & 2500 \end{array}$$

If the numbers of the price given will not be exactly set down in Decimals. As for example, at 7 pence 3 farthings a yard, what will 100 yards cost? Set down your price as near as may be, by your Decimal Table, which is 322916 sevenths, add unto it 2 cyphers, makes 32291600; and because your fractions are sevenths, cut off 7 figures, and there will be 3 pound, 4 shillings, 7 pence.

Example.

2 Example.

$$\begin{array}{r} 1. | 1.2.3.4.5.6.7 \\ 3 | 2291600 \end{array}$$

And thus much shall suffice for Numeration in Decimals : I will now proceed unto the second Rule of Arithmetick, viz. Addition in Decimals.

C H A P. II.

Addition in Decimals of Coyn.

IF you have divers several numbers given in Decimals to be added together into one sum, place then in order every one right under his like denomination, or kind, Integers under Integers, Primes under Primes, Seconds under Seconds, &c. Then begin your Addition at the right hand at the least Denomination first, and add them all according to the Rule of Addition, as if they were all whole numbers, always having a care to mark out your prime line, and the total of your Addition will shew you the just value of those whole numbers and fractions.

I Ex-

1 Example.

Integers.	1.2.3.4.5
3576	7 2 5 0 0
2400	0 3 2 5 0
7206	5 1 2 5 7
3278	6 3 7 5 6

16461 | 9 0 7 6 3

Total is 16461 l. 18 s. 1 d. 3 q.

	l.	s.	d.	q.
Here the first number is	3576	14	6	0
The second number is	2400	00	7	3
The third number is	7206	10	3	0
The fourth number is	7278	12	9	0

The total sum is 16416 18 1 3

C H A P. III.

Subtractions in Decimals.

IF you have 2 numbers in Decimals, the one to be subtracted from the other, place them one above the other, as in Addition, the greater numbers in the upper part, & the smaller numbers right underneath, & then subtract them as if they were whole numbers and

and note down the remainders each in their proper places, as in this example.

1 Example.

	li.	1.	2.	3.	4.	5.	
Lent	78569	7	8	5	6	3	
Paid	69587	0	6	2	5	0	
<hr/>							
Rest	8982	7	2	3	1	3	li. s. d.
							8982 14 5
<hr/>							
Proof	78569	7	8	5	6	3	

	li.	s.	d.	ob.
The proof, Lent	78569	15	8	1:2
Paid	69587	1	3	0:0
<hr/>				
	8982	14	5	1:2

2 Example.

	li.	1.	2.	3.	4.	5.	
Lent	38057	3	2	5	6	7	
Paid	29730	9	6	2	5	4	
<hr/>							
Rest.	8326	3	6	3	1	3	
<hr/>							
Proof	38057	3	2	5	6	7	

The

The Proof in Coyn.

	<i>l.</i>	<i>s.</i>	<i>d.</i>
<i>Lent</i>	38057	6	6
<i>Paid</i>	29730	19	3
<hr/>			
<i>Rest</i>	8326	7	3
<hr/>			
<i>Proof</i>	38057	6	6
<hr/>			

C H A P. IV.

Multiplication in Decimals.

IF you have two numbers given to be multiplied in Decimals, place your Multiplicand uppermost, and your Multiplier right underneath, as if the same were absolute whole numbers, and no fractions at all; and when your numbers are placed, mark how many Fractions your two numbers do contain, and note that number down, and multiply according to any of my former instructions in the first Book; and when the Product is gathered, cut off by your prime line just so many figures and cyphers as your, Multiplicand and Multiplier had fractions between them, and the work is ended.

Example.

Example.

If you will multiply 758|325 thirds, by 385|7 primes, I place first my numbers, and then I find my multiplicand to have 3 Fractions, to wit primes, seconds, and thirds; and I find my multiplier to have one Fraction, onely primes, which makes 4 Fractions, and so many many figures I cut off from the product.

Example.

$$\begin{array}{r}
 1.2.3 \\
 758321 \\
 3857 \\
 \hline
 5308275 \\
 3791625 \\
 6066600 \\
 2274675 \\
 \hline
 292485|9525
 \end{array}$$

2 Example.

If you will multiply 34 pound 5 shillings 3 pence, by 16 pound, 6 shillings, 6 pence, set them in Decimals, 34|2625 fourths, by 16|325 thirds, and multiply them together, and cut from the Product 7 figures to the right hand, and the Product will be 559 pound, 6 shillings, 8 pence *ob.* almost.

Example

Multiplication:

277

Example.

$$\begin{array}{r}
 \text{I.2.3.4} \\
 \hline
 342625 \\
 16325 \\
 \hline
 1713125 \\
 685250 \\
 1027875 \\
 2055750 \\
 342625 \\
 \hline
 5593353125
 \end{array}$$

3 Example.

If you will multiply 758 Integers by 3 primes, 7 seconds, 5 thirds, which is by 7s. 6 d. place them as in the last example, and from the Product cut off the 3 Figures for the 3 Fractions, and the total is 284*l*. 5 shillings, the sum that 758 ells will cost at 7 shillings 6 pence an ell, &c.

Example.

$$\begin{array}{r}
 758 \\
 375 \\
 \hline
 3790 \\
 5306 \\
 2274 \\
 \hline
 284250
 \end{array}$$

If

278 *Decimal Arithmetick.*

If you will multiply Fractions by Fractions in Decimals; as to multiply 5 primes, 2 seconds, 6 thirds, 3 fourths, by 7 primes, 2 seconds, 5 thirds; set them as before, and cut off 7 figures.

Example.

$$\begin{array}{r} 1.2.3.4 \\ \hline 5263 \\ 725 \end{array}$$

$$\begin{array}{r} 26315 \\ 10526 \text{ makes } 7s. 7d. ob. \\ 36841 \end{array}$$

| 3815675

If you will multiply in Decimals by 10 or by 100; or by 1000, &c. set down your numbers, and mark how many Fractions there be in your Multiplicand, and then add so many cyphers as your Multiplier hath cyphers to the right hand, and cut off your prime line, and the work is ended; as in this example.

Example.

$$\begin{array}{r} 1.2.3.4.5.6 \\ 7856025 \\ 100 \end{array}$$

$$\begin{array}{r} 7851.12s. ob. \\ 785|602500 \end{array}$$

Hen

*How to change any Fraction given
into Decimals.*

Admit there be a quotient of a Division, which is 358 l. 126 : 255 of one pound, which Fraction you would turn into Decimals; add a cypher to the Numerator of your Fraction, makes 1260: but because your number will not be evenly divided by your Denominator 255, therefore add more cyphers, and then divide the number by 255, makes 49411 fifts in Decimals, to be joy-
ned with the whole numbers 358|49411 fifts, and are now fit for *Multiplication* and *Division* in Decimals.

5 Example.

$$\begin{array}{r}
 358 \\
 2400000 \\
 12600000 \\
 25500000 \\
 25500000 \\
 222
 \end{array}
 \begin{array}{r}
 1.2.3.4.5 \\
 (49411
 \end{array}$$

Admit there be a fraction to be set out in Decimals thus, it is required to know what 156 yards of cloth will cost at 196:784 of a pound for one yard. Add to 156.2 or more cyphers, and divide by the denominator 784, makes 25 seconds, by which multiply 156 yards, makes 39 pound.

0

6 Ex-

6 Example.

156	00	
25	3320	12
780	196000	(25
312	7844	
3900	78	

7 Example.

For the proof of this work, multiply 156 by 196, makes 305.76: which divided by 784, makes 39 pound; as before.

196	00	
156	3320	
1176	196000	
980	7844	
196	78	
30576		(39 the proof.

CHAP.

C H A P. V.

Division in Decimals.

IF you will divide any numbers in Decimals, either whole numbers by Fractions, or Fractions by whole numbers, or whole numbers and Fractions by whole numbers and Fractions; set them down according to the Rules in Decimals in the operations before going. As for example, a certain Merchant bought him as much Cloth as cost him 284 *li.* 5 *s.* at 7 shillings 6 pence an ell, the question is how many ells he had for his money? To do this, or any other the like question, divide your sum of money 284 pounds, 5 shillings, by 7 shillings 6 pence, and the quotient will shew you what number of ells, and parts of an ell (if any be) were bought for that money

Example.

0	
380	
284280	Ells.
284280	(758
37888	
377	
3	

O 2

H. W.

How to divide the smaller number by the greater.

If you will divide 34 pound, 6 shillings, amongst 36 men; place your numbers, adding 3, or 4, or 5 cyphers; and then divide by 36, makes 95277 fiftths; or in Coin 19*s*. 0*d*. 0*b*. for every mans proportion.

2 Example.

$$\begin{array}{r}
 3 \times 2 \times 2 \\
 19 \text{ } 88 \\
 343 \text{ } 0000 \\
 36666 \\
 333
 \end{array}
 \quad
 \begin{array}{l}
 1.2.3.4.5 \\
 (95277, \text{ or } 19\text{s. } 0\text{b. } 1.4
 \end{array}$$

What is the quotient of 724 pound, divide by 3:4 of a unite, or 15*s*? Answer: divide 724 by 75 seconds, makes 965,1:3, for trial whereof, multiply 965 1:3 by 15 shillings, or 75 seconds, makes 724, as in the example.

2 Example.

2 Example.

$$\begin{array}{r}
 422 \\
 49885 \\
 724888 \\
 75555 \\
 777 \\
 \hline
 \end{array}
 \begin{array}{r}
 1.2.3 \\
 (965|333 \text{ or } 965 \quad 1:3 \\
 75 \\
 \hline
 4825 \\
 67555 \\
 2 \\
 \hline
 \end{array}$$

The proof.

724|60

This last question is in effect no other but as the former : for if I shall say, a Merchant buyes Broad-cloth, costs him 724 pound at 15 shillings or 3:4 of a pound one yard, the question is, what number he had for his money? and by *Division* I find he had 965 yards, and 1 third part of a yard, as is proved in the example ; and so dividing 724 by 3:4, the quotient is 965, 13.

3 Example.

If you will divide the Product of the second example in *Multiplication*, which was 559|3353 125 sevenths, by 16325 for the proof of that work, which ought to bring out the Multiplicand 34|2625; or rather if

O 3. you

you will divide 559 pound, 6 shillings, 8 pence, *ob.* almost by 16 pound, 6 shillings, 6 pence, the quotient will be 4 pound, 5 shillings, 3 pence.

Example.

x	8	
4	2288	
69	68886	1. 1. 2. 3. 4

16	325	8	3383428	(34 2625
		888	0000008	

489	7500005
65	305552
3	26966
	9721
	38

The 559|3353125 proof.

How to find the Prime line in any Division Decima', or to find the true Denomination of the Quotient.

In any Division Decimal, always mark out your prime line in your dividend with a straight down line with the pen, then set your Decimal fractions in primes, seconds, thirds, fourths, &c. beyond the line; also do the like in your divisor, and then mark how often you may remove your divisor, that the whole

whole numbers of your divisor may stand under the whole numbers of your dividend, and so many figures shall your quotient have in whole numbers, the rest are to be marked with pricks in the quotient for primes, seconds, thirds, &c.

If you will divide 938|61375 fifts by 34 pound, 35 seconds, then place them with pricks, as in the example following. I find, having placed my divisor underneath my dividend, that I may remove my divisor twice under the whole numbers of my dividend, and therefore I conclude, the first 2 numbers of my quotient will be whole numbers, which I mark from the rest of the numbers in the quotient with a line, and then dividing according to the former instruction, you shall find the quotient will be 17 l. 3 primes, 2 seconds, and 5 thirds.

Example.

27				
938	61375			
34	35			
17	3	2	5	or 27 6 9
34	35			
34	35			
34	35			
34	35			
34	35			

2 Example.

If you would divide 1555 4 pound, 2 primes, 5 seconds, or 5 shillings, by 45 *ll.* place them as in the example following, and you shall find that there will be in the quotient 3 figures in whole numbers, and the rest will be primes and seconds, so that dividing of 1555 4 pound, 5 shillings, by 45 pound, the quotient is 345 pound, 13 shillings.

Example.

$$\begin{array}{r}
 22 \\
 2429 \overline{) 3255} \\
 3255 \overline{) 3255} \\
 \hline
 3255 \\
 3255 \\
 \hline
 0000
 \end{array}
 \quad
 \begin{array}{r}
 l. \quad 1. \quad 2. \quad l. \quad s. \\
 (345 \mid 65 \text{ or } 345 \quad 13
 \end{array}$$

3 Example.

If the greater number of your Divisor be primes, then the figures of your whole numbers in the quotient will be once greater in value, then the times you can remove your Divisor, as if you would divide 241 pound, 5 primes, by 7 primes, then whereas you can remove your Divisor but two times under the whole numbers 241, yet you shall have 3 numbers in the quotient in the whole numbers, because your first figure of your Divisor is

Divison.

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is primes; so that in dividing 241 1/5 primes by 7 primes, I find the quotient will be 345 pound, or integers, and so many yards, at 14 shillings a yard, which is 7 primes, will 241 pound 10 shillings buy.

Example.

$$\begin{array}{r} 33 \text{ yards or pounds.} \\ 241 \overline{) 8415} \\ \underline{777} \end{array} \quad (345$$

4 Example.

If you will divide 16 pound, 875 thirds, which is 16 l. 17 s. 6 d. by 375 thirds, which is 7 s. 6 d. or which is all one, imagine there is as much cloth of 7 s. 6 d. a yard, as cost 16 l. 17 s. 6 d. the question is how many yards was bought for that money? placing your numbers as in the example following, I find 45 yards is the answer to the question.

Example.

$$\begin{array}{r} 33 \text{ yards.} \\ 282 \\ 375 \\ 16 \overline{) 875} \\ \underline{375} \\ 37 \end{array} \quad (45$$

05

5 Ex.

5 Example.

If you will divide whole numbers and fractions by whole numbers, place the whole numbers and fractions uppermost, and mark out your prime line, and then set your Divisor underneath the lowest figure in value of your Divisor, will shew you what is the denomination of the first figure of your quotient. As if you would divide 13 $\frac{1}{95}$ seconds, by 45; or which is all one, if you shall say, If 45 pieces of Figs cost me 16 $\frac{1}{19}$ s. what did one piece cost? Divide 13 $\frac{1}{95}$ seconds by 45, makes 31 seconds, or 6 s. 2 d. 2 s. of a penny for the price of one piece. And in this sort the price of any number of yards, ells or pounds, being given it in dividing by the number of yards ells or pounds, the quotient will be the price of one; and by this Rule you save a labour of Reduction, always dividing the price by the number given, the greater by the lesser, or the lesser by the greater.

Example.

4	I	2	s.	d.	d.
3368	(3	2 or 6		2	25
455					
*					

6 Example.

6 Example.

If 256 ells of cloth cost 575 pound, 7 primes, what will one ell cost? divide 575 pounds, 7 primes by 456 ells, makes 1 l. 2625 fourths, or in Coin, 1 pound, 5 shillings, 3 pence for the price of one ell.

 2822
 #195#8 l. 1.2.3.4 l. s. dr.
 #75|700 (1 2 6 2 5 or 1 5 3
 #566666
 #5555
 ###

Reduction in Decimals

If you will reduce 75 pound, 12 shillings, 9 pence into Decimals, enter your Decimal Table, and for 12 shillings find 6 primes; then look for 9 pence, and you shall find 375 fourths; so the total is 75 pound, 6375 fourths, and are now fit and apt for any Decimal operation.

If you multiply and divide 84 pound, 13 shillings 6 pence, by 17 pound, 3 shillings, reduce them into Decimals by the Table, makes for 84 pound, 13 shillings, 6 pence, 84:675, and for 17 pound, 3 shillings, 17:15 and:

and are now fit to be multiplied or divided one by the other.

If you will reduce 189:756 parts of a pound into Decimals, divide 189, adding 1 cypher to it, by 756, makes 25 seconds, for that Fraction in Decimals: And now for example, if 158 ells of Cloth & 189:756 parts of an ell, cost 70 *l.* 2 *s.* 6 *d.* what will 640 ells cost at that rate? Now according to vulgar Arithmetick, either I must reduce 158 ells 189:756 parts of an ell into 756 parts, or otherwise I must reduce the Fraction into his least terms, makes 11:4; then I multiply or reduce 158 ells into fourths, make 633 fourths for the first number in the Golden Rule. Secondly, reduce 79 *l.* 2 *s.* 6 *d.* into pence, makes 18990 pence for the second number; then put 640 ells into fourths, makes 2560 fourths; then multiply 18990 by 2560, makes 48614400; which divide by 633, makes 320 pound.

Example.

$$\begin{array}{r}
 \text{79} \\
 \text{4326} \\
 \text{48614400} \quad \text{4} \quad \text{li.} \\
 \text{6333333} \quad \text{(4860} \quad \text{(320} \\
 \text{63333} \quad \text{2560} \\
 \text{6333} \quad \text{25} \\
 \text{666}
 \end{array}$$

The

The same example wrought by Decimals.

If 158 ells 1:4 ell cost 79*l.* 2*s.* 6*d.* what will 640 ells cost at that rate? Place them in decimals thus; if 158|25 seconds cost 79|125 thirds, what 640 ells? Multiply 79|125 thirds, by 640, makes 5064000; which divide by 15825, makes 320 *l.* the quotient.

Example.

$ \begin{array}{r} 1\ 2\ 3 \\ 79 \overline{) 1\ 2\ 5} \\ \underline{6\ 4\ 0} \\ 3\ 1\ 6\ 5\ 0\ 0\ 0 \\ 4\ 7\ 4\ 7\ 5\ 0 \\ \hline 50940\ 00 \end{array} $	$ \begin{array}{r} 1114 \\ 3178 \\ 282896 \\ 8840000\ (320 \\ 882558 \\ 8822 \\ 88 \end{array} $
---	--

Or otherways.

Divide 15825 by 79125, adding one cypher, makes 2. primes for the quotient; wherefore I conclude, that one half of 640 pound which is 320 *l.* is the answer to the question demanded. Also divide 79125 by 15825, the quotient is 5 primes, by which multiply 640 pound, makes 320 pound for the answer to the question as before.

If a *Pb. lips* Dollar be worth 4 shillings 8 pence,

pence, what are 465342 Dollars worth in sterling money? Answer, multiply 456342 by 2 primes, which is 4 shillings, and take the sixth part of that product, and add unto it, makes 1085798 primes for the answer.

Or otherwise, multiply by 2 primes, and 1:3 of a prime, because 8 pence is 1:3 of a prime, and both ways will produce the same answer.

Example.

465342	465342
2 1:6	2 1:3
93068 4	93068 4
15511 4	15511 4
108579 8	102579 8

If a common Dollar be worth 4 shillings, and a Princes Dollar be worth 4 shillings 6 pence how many Princes Dollars will pay for 5384 common Dollars? Multiply 7584 by 4 s. and divide by 4 s. 6 d. makes 6741 Dollars and 7 seconds, and 5 thirds will remain, which is 18 d. so that I conclude 6741 Princes Dollars at 4 s. 6 d. a piece will pay for 7584 common Dollars, and there will remain 18 pence.

Example.

Reduction

By Decimals.

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7584	<i>Example.</i>	
2	<i>295575</i>	Dollars 23
15168	<i>2526800</i>	(6741 75
	<i>225555</i>	
	<i>2222</i>	
	<i>22</i>	

In 654 pound, how many Dollars of 3 shillings a piece? Add 2 cyphers to 654, makes 65400, because 3 shillings hath 2. fractions in Decimals, viz. primes, and seconds; which is one prime and 5 seconds, by which divide 65400, makes 4360 Dollars at 3 shillings a piece.

Example.

<i>65400</i>	<i>1 Dollar.</i>
<i>2875</i>	(4360
<i>222</i>	

In 756 pound, how many Dollars of 3 shillings 9 pence a piece? Add 4 cyphers to 756, makes 7560000; which divide by 2875, which is 3 s. 9 d. in Decimals, makes 4032 Dollars. Behold the Example following.

Example.

Example.

$$\begin{array}{r}
 375 \\
 756000 \\
 \times 875555 \\
 \hline
 375 \\
 \times 88 \\
 \hline
 3
 \end{array}
 \quad
 \begin{array}{r}
 \text{Dollars.} \\
 (4032
 \end{array}$$

If I do sell 346 yards of Velvet for 298 pound, 8 shillings, 6 pence, how do I sell one yard? Answer, divide the price by the quantity of yards in decimals, makes 1625 fourths, or in Coin 17 shillings, 3 pence for the price of one yard.

Example.

$$\begin{array}{r}
 3 \\
 87 \\
 \times 1663 \\
 29814250 \\
 346666 \\
 3444 \\
 33 \\
 \hline
 \text{Makes } 17 \text{ s. } 3 \text{ d. a yard.}
 \end{array}
 \quad
 \begin{array}{r}
 1.2.3.4 \\
 (8625
 \end{array}$$

A Merchant would buy several sorts of Spices of several prices, to wit, of 3 shillings a pound, of 2 shillings, of 2 shillings 3 d. of 1 shilling 7 pence, and of 1 shilling 2 pence

of yards, ells, pieces, or pounds, and the product will be the sum that you seek, if you do but mark out the prime line, as shall appear by examples following.

1 Example.

If one pound weight of small Ginger cost 7 pence half penny, what will 112 pound weight cost? Find for 7 pence half penny 3125 fifts, which multiply by 112 $\frac{1}{2}$ makes 350000; from which cut off 5 figures to the right hand by the prime lines, and the sum is 3 pound, 5 primes, or 3 *li.* 10 shillings, because your Multiplicand hath 5 fractions.

Example.

$$\begin{array}{r}
 2.3.4.5 \\
 \hline
 3125 \\
 112 \quad 1.2.3.4 \\
 \hline
 6250 \quad 171 \frac{1}{2} 500 \\
 3125 \quad \text{makes } 171 \frac{1}{2} 5. \\
 3 \overline{) 125} \\
 \hline
 3 \overline{) 50000}
 \end{array}$$

How

How to find the price of any Unite in any place of 10, or 100, or 1000, the price of one being given.

If the price of a Unit be given at any rate, and from thence you desire to know, what 10, or 100, or 1000, or 10000 will cost at that rate? Or otherwise, if you desire to know, if you do gain any rate desired by the pound, and would know at what rate it will be in the 100 pound, or upon exchange from place to place, the exchange of 1 *li.* being given, you desire to know what 100 *li.* will amount unto? Place your rate or gains given in Decimals by help of the Table, and then adding of one, two, or three, or more cyphers, cutting off your prime line, you shall know your desire, making the denominations of your fractions, if the least to the left hand be primes, seconds, thirds, fourths, fifths cutting off by your prime line so many figures from the right hand.

2 Example.

If 1 *li.* sterling be 1 *li.* 14 *s.* 3 *d.* Flemmish, what is 100 *li.* sterling worth? Place 1 *li.* 14 *s.* 3 *d.* in Decimals, makes 1 | 7 1 2 5 fourths: then because 100 pound hath two cyphers, makes 1712500: then cutting off 4 figures.

4 figures to the right hand, you shall find 17 $\text{l. } 5 \text{ s.}$ for 100 l. sterling, to make as appeareth before.

If one ell of Cambrick cost 7 $\text{s. } 6 \text{ d. } 3 \text{ farthings}$, what will 100 ells cost at that rate? Place 7 shillings, 6 pence, 3 farthings in decimals, makes 378125 sixths, and adding two cyphers for 100, makes 37812500: from which cut off 6 figures to the right hand, makes 37 $\text{l. } 16 \text{ s. } 3 \text{ d.}$ for the sum that 100 ells will cost.

3 Example.

1.2.3.4.5.6

37.812500

Makes 37 $\text{l. } 16 \text{ s. } 3 \text{ d.}$

4 Example.

1112|5000

If one pound or piece cost 1 pound 2 shillings 3 pence, what will 1000 pieces cost? Set 1 $\text{l. } 2 \text{ s. } 3 \text{ d.}$ in Decimals, makes 11125 fourths, to the which add cyphers, because 1000 hath 3 cyphers, and from the total cut off 4 figures, makes 112 $\text{l. } 10 \text{ s.}$ as in the example above.

If one ell of Holland cost 3 $\text{s. } 3 \text{ d.}$ what will 343 ells cost? Multiply 343 by 3 $\text{s. } 3 \text{ d.}$ in decimals, which is 1625 fourths, makes 55 pound, 14 shillings 9 pence.

5 Example

5 Example.

1	2	3	4
1	6	2	5
3	4	3	

6 Example.

1	2	3
9	7	2
7	7	5

6	4	5	7	5
48				

4	8	6	0
68	0	4	
680	4		

55 | 7 3 7 5

753 | 3 0 0

If one yard of Velvet cost 15 s. 6 d. what will 972 yards cost? Find for 15 s. 75 seconds; then for 6 d. find 25 thirds, total is 775 thirds, by which multiply 972, makes 753 l. 6 s. as above in the sixth example.

If one yard of Velvet cost 17 s. 7 d. 3 q. what will 157 yards cost? First, find 17 s. to be 85 seconds, then 7 d. 3 q. makes 322916, total is 8822916; which multiply by 857, makes 756 l. 2 s. 5 d. 3 q.

7 Example.

1	2	3	4	5	6	7
8	8	2	2	9	1	6
				8	5	7

8 Example.

1	2	3	4	
1	3	7	5	
		7	5	8

6	1	7	6	0	4	1	2
44	1	1	4	5	8	0	
705	8	3	3	2	8		
756	1	2	3	9	0	1	2

1	9	0	0	0
11	8	7	5	
106	1	2	5	
180	0	2	5	0

If

If one Dollar be worth 4 s. 9 d. what are 758 Dollars worth in sterling money? multiply 4 s. 9 d. which is 2375 fourths, by 758, makes 180 pound, 6 pence, as in the eighth Example above.

The price of any number of yards, ells, pieces on pounds given to find the price of a unite.

If the price of any number of yards, ells, pieces, or pounds be given, set them down in Decimals, adding 1, 2, or more cyphers if need require, and divide that sum, or price by the number of yards, ells, pounds, or pieces, and the quotient is the price of a unite in whole numbers, primes, seconds, and thirds, without Reduction, as shall appear by examples following: And in this manner you may know what sum of money was lent, if the Principal and Interest be given at any rate in the hundred: or you may know if the rate of 1 % exchange be given for any place, you may know the value of 100 of that Coyn in that money given; and by this rule is to be abbreviated almost all operations of Arithmetick, by finding the value of a unite in any place desired.

If 542 ells of Cloth cost 22 l. 4 s. 6 b. what cost 1 ell at that rate? divide 22 01875 sixths by 542, makes 40615 sixths, or in Coyn 9 d. 3 farthings

3 farthings for the price one ell cost.

I Example.

$$\begin{array}{r}
 227 \\
 33354 \\
 22018750 \\
 3422222 \\
 88888 \\
 888
 \end{array}
 \begin{array}{r}
 2.3.4.5.6 \\
 (40625
 \end{array}$$

If 345 *l.* gain 79 *l.* 12 *s.* what doth 1 *li.* gain? Divide 7660000 by 345 *l.* makes 222028 sixths, or in Coin, makes 4 *s.* 5 *d.* 6 *ob.* almost, that 1 *li.* doth gain, as in the example following.

2 Example.

$$\begin{array}{r}
 412 \\
 7762 \\
 761010 \\
 76600000 \\
 34555555 \\
 388888 \\
 3333
 \end{array}
 \begin{array}{r}
 1.2.3.4.5.6 \\
 (222028
 \end{array}$$

If 756 *l.* 3 quarters, 24 *l.* of Sugar cost 422 *l.* 12 *s.* what did 1 pound weight cost, accounting 112 pound to the hundred? Reduce 756 *l.* 3 quarters, 24 *l.* in pounds futtle accounting 122 pound to the hundred, makes

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makes 84780 $\frac{1}{10}$. then divide 442 $\frac{1}{10}$. 12 $\frac{1}{10}$ by 84780, makes 5215 fifths, or 12 pence half penny one pound.

3 Example.

$$\begin{array}{r}
 \cancel{4}32 \\
 \cancel{2}3568 \\
 \cancel{2}82482 \quad 2345 \\
 \cancel{4}\cancel{4}\cancel{2}\cancel{1}68888 \quad (5215 \\
 8478888 \\
 84777 \\
 844 \\
 8
 \end{array}$$

If I sell 7000 pieces of Cambrick for ¹⁰⁰⁰700 $\frac{1}{10}$. how do I sell one piece? Divide 1000 by 700, makes 1 $\frac{1}{10}$. 42857 fifths, 1 pound 8 shillings 6 pence 3 farthings, as in the example following.

Example.

$$\begin{array}{r}
 32648 \\
 8888888888 \quad \text{1. 1.2.3 4.5} \\
 7777777777 \quad (1. | 22857
 \end{array}$$

If one pound sterling be 1 pound 14 shillings, 3 pence *Flemmish*, what is 1 pound *Flemmish* worth? Divide 1 pound with cyphers by 17125, makes 11 shillings 8 pence 1 farthing almost.

5 Example.

5 Example.

$$\begin{array}{r}
 2 \\
 681 \\
 2 \overline{) 37288} \quad 1.2.3.4 \\
 \underline{100000000} \quad (5839 \\
 272288888 \\
 272222 \\
 2722 \\
 27
 \end{array}$$

If 1 \textsterling be 1 \textsterling . 14 s . 7 d . ob. *Flemish*,
 what is 100 \textsterling . *Flemish* worth in \textsterling
 money? Divide 100 by 173125 fifths,
 which is 1 \textsterling . 14 s . 7 d . ob. in Decimals,
 makes 57 \textsterling . 15 s . 3 d .

6 Example.

$$\begin{array}{r}
 22 \\
 2079 \\
 232987 \\
 2343888 \quad 1.1.2.3 \\
 \underline{100000000} \quad (577 \\
 27338888 \\
 2732222 \\
 27333 \\
 277 \\
 2
 \end{array}$$

The Golden Rule in Decimals.

If the number given be pounds, shillings,
 P and

and pence, set them out in Decimals, and also your number of yards, ells, pieces, pounds, or any other numbers, set them out also in Decimals, and then without Reduction, multiply the third number by the second, and divide by the first, according to the instructions of *Multiplication* and *Division*, in the former part of this Book, and the quotient will be the third number sought.

Example.

If 34 ells of Canvass cost 1 *l.* 4 *s.*, what will 756 ells cost at that rate? Multiply 756 by 1 pound, 2 primes, makes 907 $\frac{1}{2}$ primes; which divided by 34, adding cyphers, makes 26 $\frac{6823}{4}$ fourths, or in Coin, 26 *l.* 13 shillings: 8 pence.

Example.

756	
12	22 1
1512	245423
756	3238828 / 1.2.3.4
9072	8872000 (26 6823
	3444444
	33333

If 112 pound of Indico cost 34 pound, 17 shillings, what cost 789 pound subtil, accounting 100 pound to the hundred? Multiply

The Golden Rule.

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tiply 34|85 seconds by 789, makes 27496/.
65 seconds ; which divided by 112 pound,
makes 245 pound , 5058 fourths, or 10 s.
1 penny farthing.

Example.

1.2			
3485			
789			
31365	8		
27880	888	8	
24395	8888	888	
27496 65	8888	888	

If 98 ells of Cloth cost 94 pound , 13 s.
6d. what cost 2943 ells at that rate? Di-
vide the third number by the first, and by
the quotient multiply the second, and the
product will be the answer sought.

2943 (3			
98x	94		1.2.3
			675
			3
	284		025
	Makes 284 l. 6d.		

If 112 pound of Sugar cost 5 pound 3 s.
9 pence , how many pounds will 124
P 2 p d

pound buy at that rate? Divide $5\frac{1}{4}$ fourths by 112 pound, to find the price of 1 pound, makes $46\frac{3}{4}$ sixths, or in Coin 11d. 1:10 of a penny almost, for the price that one pound cost. Secondly, divide 124/. by the price of one pound, viz. by $46\frac{3}{4}$ sixths, makes $2677\frac{1}{3}$ primes, and so many pound he shall have for 124 pound.

If one yard of Broad-cloth cost 16 s. 9 d. how many yards shall 56 /. buy at that rate? Divide 56/. by 16 s. 9 d. the price of one yard, makes 66 yards, 9:10 almost.

Example.

$$\begin{array}{r}
 5 \\
 250 \\
 878000 \text{ yards.} \quad \text{yard.} \\
 8600000 \text{ (66} \quad 86:100 \\
 8378888 \\
 83777 \\
 833 \\
 8
 \end{array}$$

If 7 yards 1:2 of cloth cost 9 s. what will 8 yards 1:3 of a yard cost? Multiply 9 shillings, or 45 seconds, by 8, 1:3 makes 375: which divide by 7 yards 1:2, or by $7\frac{1}{2}$ primes, makes 5 primes, or 10 shillings.

Example.

Example.

$$\begin{array}{r}
 1 \\
 4 \overline{) 5} \\
 8, \quad 1:3 \\
 \hline
 360 \quad 3780 \quad (5, \text{ or } 10 \\
 15 \quad 78 \\
 \hline
 \end{array}$$

375

If 5 yards 1:2 cost 4s. 8d. 1:4 of a penny, or 56, 1:4, what will 30 yards cost at that rate? Set your 56. 1:4 in Decimals, makes 56|25 seconds, which multiply by 30, makes 1687|50 seconds; which divided by 5 yards one half, or 5|5 primes, makes 306 pence 8:10 of one penny for the price of 30 yards, as in the example following.

Example.

$$\begin{array}{r}
 56 \overline{) 25} \\
 30 \\
 \hline
 1687 \overline{) 50}
 \end{array}
 \quad
 \begin{array}{r}
 2342 \quad d. \quad | \\
 168780 \quad (306 \quad 8 \\
 88888 \\
 388 \\
 \text{or } 25 \text{ s. } 6 \text{ d. } 4:5 \text{ of } 1 \text{ d.}
 \end{array}$$

If 34 ells 3:4 of Holland cost 3 pound, 6 shillings 1 penny half penny, what will 756 ells 1:2 cost at that rate? Multiply 1 pound 6 shillings one penny half penny, which

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Decimal Arithmetick.

which is $3|30625$ fifths by $756|5$ primes, makes $2501|178125$, which divided by 34 ells $3:4$, or by $34|75$, makes $7|9763$ thirds, or 71 pound 19 shillings 6 pence.

Example.

$$\begin{array}{r}
 1.2.3.4 \\
 3|3625 \\
 7565 \\
 \hline
 168125 \\
 201750 \\
 168125 \\
 235375 \\
 \hline
 2543|73125
 \end{array}$$

$$\begin{array}{r}
 8|93 \\
 228 \\
 2543|73125 \\
 34755555 \\
 347777 \\
 3444 \\
 33
 \end{array}
 \quad
 \begin{array}{r}
 1.1.2.3 \\
 (73|200
 \end{array}$$

If 346 pound 10 shillings gain 32 pound 8 shillings, what will 75 pound gain at that rate? First multiply $32|4$ primes by 75 makes $2430|0$ prime; which divided by $347|5$ primes, makes $7|0129$ fourths, or 7 pound 3 pence for the answer.

Example.

Example.

324	3	
75	2 6 4 2	
1020	* 1 3 3 3 3	1. 1. 2. 3. 4.
2268	2 * 3 3 3 3 3 3 3 3	(7 0 1 2 9
2430 0	3 * 6 3 3 3 3 3	
	3 * 8 8 8 8	
	3 * * *	
	3 3	

The same question wrought a second way.

Divide 32 | 4 primes, by 346 | 5 primes, adding 5 cyphers, and the quotient will be 935 fourths; which multiply by 75, makes 70125 fourths, which doth not want one farthing of the former sum.

The same question wrought another way.

Divide 75 pound, adding 5 Cyphers by 346 pound, 5 primes, and the quotient will be 21645 fifths; which multiply by 32 | 4 primes, makes 7012980, from which abate 6 figures to the right hand, because of your 6 fractions, and the remainder will be 71. or 126 fourths, &c. as before. And in this manner you may work any question in the Rule of Three, 3 several ways, and prove the work one by the other.

P 4

If

If 12 shillings do buy 74 pound of Ginger, how much shall I have for 100 pound? Divide 7400, which is the product of 74 by 100, by 12*s.* or 6 primes, and the quotient will be 12333 pound, 1:3, and so much Ginger shall I have for 100 *l.* at that rate; or otherwise divide 100 *li.* by 6 primes, makes 166 ~~2~~ 2:3, which multiply by 74, makes 12333 pound, 1:3 as before.

Brief Rules how to abbreviate your work in the Golden Rule, by marking the proportions between the numbers given.

When as any question is propounded in the Golden Rule, mark what proportion is between the first and second numbers, or between the first and third numbers, or between the third and second; for if you espy them in any proportion, the question demanded is very speedily answered, upon the first sight; or yet if you see not them exactly to be even proportionals, yet you may subtract the first from the third, once, twice, or three times, or more, and so often take the middle number towards the answer to the question, and then you need not to multiply by your whole third number, as you shall see by example following.

I Example

1 Example.

If 34 ells cost 2*l.* 4*s.* 1*d.* what will 340 ells cost? Here comparing the first and third numbers, one with another, I find the third doth contain the first 10 times, wherefore I multiply 2 pound, 4*s.* 1*d.* by 10, and the total is 22 pound 10 pence, the Answer.

2 Example.

If 82 ells of cloth cost 4*l.* 2*s.* what will 324 ells cost at that rate? Here I find 4*l.* 2 shillings in Decimals to be one half of 82 but it standeth one room less in value then 82 doth, so I conclude, that half of 324 one room less, is 16 pound, 2 primes, or 4 shillings, the Answer.

3 Example.

If 345 ells of Holland cost 34*l.* 10*s.* what will 789 ells cost at that rate? Set down 34*l.* 10*s.* in Decimals, makes 34*l.* 5 primes, which is the first number placed but one room lower; therefore I say, if 345 ells cost 34*l.* 5 primes, one room more to the right hand, then the third number also will cost 78*l.* 9 primes one room more to the right hand, which is 78 pound 18 shillings.

P. 5

4 Ex-

6 Example.

If 12 ells of cloth cost 2 shillings 4 pence 4:5 of one penny, what will 356 ells cost? Place 2 shillings 4 pence, 4:5 in Decimals makes 1 prime 2 seconds, or 12 seconds, which is the same number, but it stands 2 rooms lower: therefore I conclude that 356 ells cost the same numbers two rooms lower, which is 3 *l.* 11 *s.* 2 *d.* 2:5 of 1 *d.*

If 12 ells cost 12 | 1.2 | *l.* 1.2
seconds, what will 356 | 0 0 | or 3 5 6
| 356 |

Example.

If 130 ells of Cloth cost 26 *l.* what will 3759 ells cost at that rate? I find the second number to be twice the first, but it stands one place nearer the right hand; therefore I conclude, that the third number will cost twice as much in his lower room, which is 751 pound 16 shillings.

If 130 cost 26 pound, what cost 3759?

130	26	3759	9	2	1.	751 8
751 8						

6 Ex-

6 Example.

If 75 ells 1 half cost 7*l.* 11*s.* what will 328|12 seconds cost? Set them down in Decimals, and you shall find them to stand thus, 75|5 primes for the first number, and 7|55 seconds for the second number, which is the same one room nearer the right hand: so I conclude, that the third number will cost 32|85 seconds, which is 23 pound 17 shillings,

Example.

Ells. 1.2

75|5
7|55

1.2

328|50
32|85

The Answer. 32*l.* 17*s.*

1 Example.

If 356 ells of Canvass will cost 38 pound, 12 shillings 1 penny, what will 740 ells cost at that rate? First, divide 740 by 356, the quotient will be 2, and therefore I take twice the price given for that quotient; and then whereas before I should have multiplied 38 pound, 12 shillings, 1 penny by 740, I shall need to multiply it but by 28 the remainder, and divide it by 346, makes 3|0368 fourths, to be added to the former sum, and the total will be as in the example following.

Example

Example.

	l.	s.	d.	37	d.
28	58	12	1	38	6
748 (2	2			28	1
356	77	4	2	308	8
	3	0	8	772	1166
	80	4	10	1:4	1080
					9166

300	l. 1. 2. 3. 4	l. d.
224376	(3) 0 3 6 8 ,	or 3 9 al-
208091666		(most
3566666		
35555		
333		

Here is the last example, I multiply 38 pound, 6 primes, be 28, omitting the penny not setting it out in Decimals, and the product is 1080|9 primes: then multiply 1 penny by 28, makes 28 pence, which is one prime 166 fourths, and the total was 1030 pound, 9116 fourths, as in the example: and in this manner you may save a great labour in multiplying your number of pounds and shillings first, and then multiply your pence by themselves, and add into the rest in primes, seconds, &c.

2 Ex-

2 Example.

If 17 ells of Holland cloth cost 3*l.* 2*s.* 5*d.* what will 515 ells cost at that rate? Divide 515 by 17, makes 30, by which multiply 3*l.* 2*s.* 5*d.* makes 93*l.* 12*s.* 6*d.* then the remainder of your division will be 5 ells, by which 5 multiply 3*l.* 2*s.* 5*d.* makes 15*l.* 10*s.* 1*d.* or in Decimals 15|50416 fifths, which divided by 17, makes 912 thirds, or 18*s.* almost; which added to 93*l.* 12*s.* 6*d.* makes the answer to be 94*l.* 10*s.* 9*d.* and so here in stead of multiplying 3120833 sixths by 515, and dividing by 17, I have saved more then half the work.

Example.

	l.	s.	d.				
5							
515 (30	3	2	5	3	2	5	
17	30			5			
17	<hr/>						
	93	12	6	15	10	1	
		18	3				
	<hr/>						
	94	10	9				
	123			1.2.3.4.5			
515 5419				(91200			
515 5419							
515 5419							
515 5419							

3 Example.

If 7 pound buy 100 pound weight of Sugar, how many pound weight will 156 buy me at that rate? Divide 156 by 7, makes 22, 2:7, by which multiply 100, makes 2228 pound 4:7.

4 Example.

If 356 pieces of Callicoes cost 300 l. 15 shillings, how much will 917 pieces cost at that rate? Divide 917 by 356, makes in the quotient 2; therefore take the price given twice, and there will remain after your division 205, by which multiply 300|75 seconds, makes 61653|73 seconds, which divided by 356, makes 173 pound, 18 seconds, or 173 pound, 3 shillings, 8 pence, to be added to the former sum 601 pound, 10 shillings, makes 774 pound, 13 shillings 8 pence for the question.

*The same Question wrought without
Reduction in Decimals.*

If 356 cost 300|75 seconds: what 917? Multiply 300|75 seconds by 917, makes 275787|74 seconds; which divide by 356, makes 774|8 seconds, or 774 pounds, 13 shillings, 8 pence, as before the proof.

Example

Example.

300 75	23	
9 17	1848	
2105 15	288832	l. 1.2
3007 5	27878778 (77468	
270675	3888888	
275787 75	38888	
	333	

Example.

If 179 pound of Indico cost 60 pound 13 shillings 5 pence, what will 716 pound cost at the same rate? Divide 716 by 179, makes 4 in the quotient, and nothing will remain: wherefore I conclude, that 4 times 60 l. 13 s. 5 d. which is 242 l. 13 s. 8 d. and is the answer to the question demanded.

6 Example.

If 36 pound of Cloves cost 11 pound, 6 shillings, how many pound shall I have for 354 l. Divide 113 primes by 36, makes 31388 fifths; which multiply be 354, cutting off figures for the 5 fractions, makes 111 pound, 11352 fifths, or 2 shillings, 3 pence, 1 farthing for the answer.

Fellowship

Fellowship in Decimals.

To work the Rule of Fellowship in Decimals, gather the whole number of all the monies disbursed into one sum, and then divide the money gained or lost by that sum, and multiply that quotient so found by each several Partners stock disbursed, and the Products will be each several mans gain or loss.

1 Example.

Four Merchants made a Company: *A* put in 60 pound, *B* 80 pound, *C* 120 pound, *D* 140 pound, and they gained 72 pound; the question is, what part each Merchant must have of the gains? First, the Total sum of all their monies disbursed was 400 pound; wherefore according to the Rule I divide 72 pounds, adding cyphers unto it by 400, and the quotient is one prime, 8 seconds; by which I multiply each several mans stock disbursed, and I find *A* shall have 10 pound, 16 shillings, *B* 14 pound 8 shillings, *C* 21 pound 12 shillings, and *D* 25 pound, 4 shillings; total is 72 pound, as in the example.

Example

Fellowship.

319

Example.

60	80	120	140
18	18	18	18

480	640	960	1120
60	80	120	140

10 80	14 40	21 60	25 20
-------	-------	-------	-------

		1. 1.2
3	1.2	10 80
7200	(18)	14 60
4200		21 40
		25 20
		<hr/>
		72 00

2 Example.

Four Merchants made a Company, and set forth a Ship to Sea, which cost them 3616 pound, 13 shillings; A. must pay 1:3 of the money; B. 1:4, C. 1:5, D. 1:6, the question is what each man must pay of the said sum? Take a number wherein the like parts may be had, which in the former Book of vulgar Arithmetick, I find to be 60, whereof 1:3 is 20 and 1:4 is 15, and 1:5 is 12, and 1:6 is 10, the total is but 57: wherefore I divide

I divide 3616|65 by 57, and the quotient is 63|45 seconds, which I multiply by 20, and I find *A.* shall pay 1269 pound; then I multiply by 15, and *B.* shall pay 951|75 seconds; and by 12: and *C.* shall pay 761|4 primes, and by 10, and *D.* shall pay 634|5 primes; the total is 3616|65 seconds, the proof of the work.

Example.

l.	1.	2	l.	1.	2	l.	1.	2	l.	1.	2
63		45	63		45	63		45	63		45
		20			15			12			10
<hr/>			<hr/>			<hr/>			<hr/>		
1269		00	951		75	761		40	634		50

3 Example.

Three Merchants made a Company: *A.* put in 56:6 primes; *B.* put in 30:8 primes: *C.* put in 120:4 primes, and they gained 58 l. 16 shillings, or 58 pound, 8 primes; what must each man have of the gains? First, the Total disbursed is 216 pound, 4 primes, and the which I divide 58 pound, 8 primes, by the quotient is 27197 fifts for one pound gain; which I multiply by each several mans money disbursed, and I find *A.* shall have 15 pound, 7 shillings, 10 pence half-penny: *B.* 10 pound, 14 shillings, 3 pence, 3 farthings;

farth
lings
poun

A.
B.
C.

Tot.

T
a Spo
cont
have
what
num
wher
in o
785
quot
whic
shall
fifts
fifts
fifts

Fellowship.

321

farthings; C shall have 32 pound, 13 shillings 9 pence 3 farthings: the total is 58 pound, 16 shillings, the proof.

Example.

	l.	1.2.3.4.5.6	l.	s.	d.	q.
A.	15	393502	15	7	10	2
B.	10	715618	10	14	3	8
C.	32	690794	32	13	9	3
Tot.	58	799914	58	16	00	0

3 Example.

Three Captains agree together to divide a Spoil or Booty, which they had taken, containing 7851*l.* in this sort; A is to have 1:2, B 1:3, C 1:4; the question is, what each mans share shall be? Find a number which bath such parts it it, viz. 12, whereof 1:2 is 6, 1:3 is 4, and 1:4 is 3, which in one sum makes 13: therefore divide 7851, adding cyphers to it by 1:3, and the quotient will be 603 pound, 92307 fifths; which multiply by 6, 4, and 3, and you shall find A shall have 3623 pound, 5384 fifths; B shall have 2415 pound, 69228 fifths; C shall have 1811 pound, 76921 fifths: The total is 7850 pound, 99991 fifths,

fifths, which doth what but 1 fourth of 7851 pound which in value is but 3:125 parts of a penny, and this example is to be wrought without the Golden Rule. Behold the proof of the work.

Example.

	<i>l.</i>	<i>1.</i>	<i>2.</i>	<i>3.</i>	<i>4.</i>	<i>5.</i>	<i>l.</i>	<i>s.</i>	<i>d.</i>	<i>q.</i>
A.	3623	5	3	8	4	2	3623	10	9	1
B.	2415	6	7	2	2	8	2415	13	10	1
C.	1011	7	9	9	2	1	1811	15	4	1
<hr/>										
	7850		9	2	9		9	1		7851 00 00 0
<hr/>										

*The same Example wrought
another way.*

After you have divided 7851 pound by 13, find in your Decimal Table what the quotient is in Coin, makes 603 pound, 18 shillings 5 pence *ob.* which multiply by 6; 4, and 3, and their Total in one sum is the answer, as before.

Fellowship.

323

<i>l.</i>	<i>l.</i>	<i>d.</i>	<i>l.</i>	<i>l.</i>	<i>d.</i>
[603	9	5 ob.	603	9	5 ob.
	6			6	

3623	5	900	2415	65	10 0
------	---	-----	------	----	------

<i>l.</i>	<i>l.</i>	<i>d.</i>
603	9	5 ob.
	3	

1811	75	4 ob.
------	----	-------

These three several Products added into one sum, make 7850 *l.* 19 *s.* 11 *d.* wanting but one penny in the whole sum, which is the defect of the Decimals, which cannot be exactly set out in Coin, but it will serve to answer a question of one Million with one penny error at the most.

5 Example.

Three men made a stock together, and they gained 244 pound, 8 shillings: *A* put in 315 *l.* 7 moneths, *B* 408 pound 13 moneths. *C* 500 pound 3 moneths, now the question is, what each man must have of the gains? First, multiply each mans stock by his time, and gather all the totals into one sum, and they make 7785; by which divide your gains, 224 pound, 4 primes, and the quotient

tient will be 31393 sixths, which multiply by the several products of each mans money and time, and the total of each several product is the sum desired for each mans part of the gain.

Example.

A.	69		22836		69	4	6	3
B.	47		08800		47	1	9	1
C	128		08210		128	1	8	0
<hr/>								
	244		40046		244	8	0	0

Position in Decimals.

Three Merchants bought a parcel of Linen cloth cost them 757 pounds, 17 shillings, whereof *A* must pay 1:4, *B* 1:5, *C* 1:8; what must each man pay of this sum? I take 20 for a number, wherein I can have those parts, viz. 1:4 of 20 is 5, and 1:5 of 20 is 4, and 1:8 of 20 is 2 pound, 5 primes, or 2 one half; their total is 11 pound 5 primes; or 111:2; by which I divide 757 pound, 85 seconds, and the quotient is 65 *l.* 9 primes, which I multiply by 5 for *A*, makes 329 *l.* 10 shillings; *B* 263 pound 12 shillings; *C* 164 pound 15 shillings: the total is 757 pounds, 85 seconds.

1 Ex-

1 Example.

B.		C.			
A.	l. 1	l. 1	l. 12		
l. 1	68 9	65 9	164 17		
65 9	4	21 22	63 6		
<hr/>		<hr/>		339 5	
329 5	263 6	164 75	<hr/>		757 85

2 Example.

A Ship-carpenter bought 300 timber trees of a Gentleman, and was to pay for the first 100 a sum of money unknown, for the second twice as much as for the first 100, and for the third 100 of trees he was to pay thrice as much as he paid for the first, and the whole 300 of Trees cost him 724 l. 12 shillings, the question is, what each 100 cost him severally, To work this question, or any other of like nature suppose a unite, or one pound for the first 100, then he must pay 2 pound for second 100, which is twice as much, and then also he must pay 3 l. for the third 100, which is three times as much as the first: but yet 1 pound, 2 pound, and 3 l. makes but 6 pound, and it should be 724 l. 12 shillings; so that now whereas in the former

as *A. B. and C.* now the question is, what each man must pay of this sum? I suppose *A* must pay 1 *l.* then *B* must pay 2 *l.* which is twice as much as *A* doth pay; and *C* must pay 6 *l.* which is thrice as much as *C* doth pay; and then *D* must pay 9 *l.* which is as much as all the other 3 do pay; but their total is but 18 *l.* and it should be 541 *l.* 16 *s.* wherefore I divide 541 *l.* 8 primes by 18, and the quotient is 30 *l.* 1 prime, or 2 *s.* for the first part. Then *B* must pay 60 *l.* 4 *s.* *C* 180 *l.* 12 *s.* and *D* 270 *l.* 18 *s.* their total makes 541 *l.* 8 primes; behold the work.

Example.

<i>2</i>	<i>l.</i>	<i>1</i>	<i>l.</i>	<i>s.</i>
$\begin{array}{r} 541 \overline{) 8} \\ 1888 \\ \hline 11 \end{array}$	(30	1	<i>A.</i> 30	2
			<i>B.</i> 60	4
			<i>C.</i> 180	12
			<i>D.</i> 270	18
<hr/>				
	The proof		541	16

4 Example.

A Cistern of water containing 600 gallons is filled with water, and hath 4 several

Q

Cock

Cocks to empty the same, whereof if they be all set open at once, the Cistern will be empty in 24 hours: now the second Cock will avoid twice as much as the first Cock in 24 hours, and the third will avoid 3. times as much as the first, and the fourth Cock 5. times as much as the first: the question is, how many each Cock doth avoid in 24 hours of the said 600 gallons.

I suppose the first Cock will avoid one gallon, then the second must avoid 2, and the third 3, and the fourth Cock 5: but yet they are but 11 gallons, and they should be 600 gallons: wherefore dividing of 600 by 11, the quotient is 54 gallons, and 6:11 of a gallon for the first Cock: Behold the work in the example following.

Example.

	<i>x</i>	Gallons.		Gallons.
1.1	<i>x</i>			
2.2	<i>xx</i>	(54 6:11	1.	54 6
3.3	<i>xxx</i>		2.	109 1
4.5	<i>xxxx</i>		3.	163 7
	<i>x</i>		4.	272 8
				2

11

xx (2 The proof.

xx

600 22

Of

Of Gain and Loss in Decimals.

If a broad Cloth 28 yards long be sold for 14 shillings a yard, and the seller doth gain 10 *l.* in the 100 ready money, what cost that broad cloth? First, by practice find the price of the 28 yards, at 14 shillings a yard, makes 19 pound, 6 primes, or 19 *li.* 12 shillings; divide 19 pound 6 primes by 100 pound, makes 17 pound, 81818 fifths, or in Coin 17 pound 16 shillings 4 pence 3 farthings.

Example.

28	8929	1. 1. 2. 3. 4. 5
7	x 96000000	(17 81818
19 6	xxxxxxx	
	xxxxx	
	xxxx	

Secondly, if 28 yards cost 17 *li.* 81818 fifths, what did one yard cost at that rate? Divide 17 *li.* 81818 fifths by 28 yards, and the quotient will be 63636, or in Coin 12 *s.* 8 *d.* 3 *q.* for the price that one yard cost.

Q 2

Example.

Example.

$$\begin{array}{r}
 \times \times \times \times \\
 \times \times \times \times \times \times \quad 1.2.3.4.5 \\
 \times \times | \times \times \times \times \quad (6 \ 3 \ 6 \ 3 \ 6 \\
 \times \times \times \times \times \times \\
 \times \times \times \times
 \end{array}$$

Thirdly, for the proof of this work, say, if one yard cost 63636 fifts, how may I sell it to gain 10 *li.* in the 100 ready money? Take the tenth part of 63636 fifts, makes 63636 sixths; which added into one Total, 69999 fifts, which doth want but one fifth of 7 primes, or 14 *s.* which proves all the former works to be true.

Example.

$$\begin{array}{r}
 1.2.3.4.5.6 \\
 6 \ 3 \ 6 \ 6 \ 3 \\
 6 \ 3 \ 6 \ 3 \ 6 \\
 \hline
 6 \ 9 \ 9 \ 9 \ 9 \ 6
 \end{array}$$

2 *Example.*

A Merchant doth deliver money at Interest for 9 moneths, after the rate of 12 *l.* in the hundred, for 12 moneths simple Interest,

rest, and at the end of 9 moneths doth receive for interest 87 £ . the question is, what was the sum lent? Answer, because the interest of 9 moneths at 12 $\%$. in the 100 is 9 $\%$. divide 870.000 by 9. and the quotient is 966 £ . 6666 fourths, or 966 £ . 13 s . 4 d . the sum lent.

Example.

$$\begin{array}{r} 666 \\ 8700000 \overline{) 9666666} \\ \underline{999} \end{array} \quad \begin{array}{r} \text{£} \quad 1. \quad 12 \quad 3 \quad 4 \\ (966 \mid 6666 \end{array}$$

3 *Example.*

If 13 pieces of Canvass cost 17 £ . 12 s . how may I sell them to gain 8 $\%$. in the hundred? Multiply 17 £ . 6 primes by 8, adding 2 cyphers, makes 19 £ . 8 thirds, or 19 li . 2 d . almost.

The proof of the former example, If 17 £ . 12 s . gain 1 li . 8 s . 2 d . what will 100 li . gain at that rate? multiply 1 li . 8 s . 2 d . or in Decimals 1 li . 408 thirds by 100, makes 140 li . 800 thirds, which divide by 17 li . 6 primes, makes 8 £ . for the rate that 100 li . will gain, which shews the former work to be truly wrought.

Q3

Example.

Example.

$$\begin{array}{r}
 \text{£.} \quad \text{1.2.3} \\
 17 \overline{) 600} \\
 \underline{8} \\
 1 \overline{) 408} \\
 17 \overline{) 008}
 \end{array}
 \quad
 \begin{array}{r}
 0 \\
 248 \overline{) 800} \\
 \underline{276}
 \end{array}
 \quad
 \begin{array}{r}
 \text{£.} \\
 (8 \text{ the proof.}
 \end{array}$$

4 Example.

If in one ell of cloth sold for 3 shillings, there be gained after the rate of 12 £. in the hundred for 12 moneths, how should that ell have been sold to gain 17 £. in the 100 for 12 moneths? Multiply 17 li. by 3 s. which is one prime, five seconds, and divide the Product by 12, makes 2125 4ths, or in Coin 4 s. 3 d. and so much must it have been sold for to gain 17 pound in the hundred.

Example.

$$\begin{array}{r}
 17 \\
 15 \\
 \hline
 85 \\
 17 \\
 \hline
 255
 \end{array}
 \quad
 \begin{array}{r}
 256 \\
 288000 \\
 22222 \\
 \hline
 288
 \end{array}
 \quad
 \begin{array}{r}
 \text{1.2.3.4} \\
 (2125 \text{ or } 4 \text{ s. } 3 \text{ d.}
 \end{array}$$

Second-

Secondly, if 3 s. give 12 l. what will 4 s. 3 d. give? Multiply 2 125 fourths by 12, and divide by 15 seconds, and the quotient is 17 l. the proof of the last example.

Example.

$$\begin{array}{r}
 1.23.4 \\
 2125 \\
 \hline
 12 \\
 \hline
 555 | 00
 \end{array}
 \qquad
 \begin{array}{r}
 100 \\
 255 | 00 \text{ (17)} \\
 255 \\
 \hline
 2
 \end{array}$$

5 Example.

A Merchant sold 24 Clothes, which cost him 342 l. wherein he lost after the rate of 10 pound in the hundred, and took in exchange 560 pieces of Raisins at 24 shillings the piece, wherein he gained 10 d. in the hundred ready money; now the question is, what his gain or loss was, and what sum of money he was to pay for the Raisins? First, 560 pieces of Raisins at 24 shillings a piece, is 672 pound; from which subtract 342 l. leaves 330 pound to pay for the Raisins. Secondly, 672 pound, at 10 pound in the hundred, is 67 pound 4 shillings for his gains by the Raisins. Thirdly, 342 pound less, 10 in the 100, is 34 pound,

Q 4

4 shil-

334 *Decimal Arithmetick.*

4 shillings to be deducted from 342 l. and then take 34 l. 4 s. from 67 l. 4 s. leaves his gains more then his loss to be 33 l.

Example.

<i>pieces.</i>	560	672	
	12	_____	342
	_____	67 2 gains	_____
	672 0	34 2	34 2 loss.
	342 _____		
	_____	33 0 clear gains.	
	330 to pay.		

6 Example.

A Merchant receiveth for principal and interest 352 l. wherein he gained 9 l. in the hundred for one year, now the question is, what was the sum of money lent? Divide 3520000 by 109 l. makes 322 l. 9357 fourths, or 322 l. 18 s. 8 d. ob. for the sum lent.

6 Ex-

6 Example.

$$\begin{array}{r}
 x \\
 38368 \\
 2822938 \\
 28200|0000 \\
 1099999999 \\
 100000000 \\
 11111
 \end{array}
 \begin{array}{l}
 1. 1.2.3.4 \\
 (322|9\ 3\ 5\ 7
 \end{array}$$

7 Example.

A Merchant hath owing unto him 540 l. to be paid at the end of three years, now his debtor will pay him ready money, if he will abate him 9 l. in the hundred. Divide 540 l. with cyphers by 109 three times one after the other, and the third quotient will be the sum that he shall pay in ready money, abating 9 l. in the hundred interest upon interest. Behold the work following.

8 Example.

$$\begin{array}{r}
 8483 \\
 3049848 \\
 84000|000 \\
 109999999 \\
 10000000 \\
 1111
 \end{array}
 \begin{array}{l}
 (4954|200
 \end{array}$$

Q5

the quotient will be the sum of money that will discharge the debt, abating 12 l. in the hundred.

Example.

$$\begin{array}{r}
 398 \\
 7 \times 8284 \\
 63200 | 000 \\
 21222 | 222 \\
 21222 \\
 21222 \\
 21222
 \end{array}
 \quad
 \begin{array}{r}
 l. \quad 1.2.3 \\
 (564 | 285 | \\
 \hline
 270 | 41
 \end{array}$$

or 564 l. 5 s. 8 d. ob.

9 Example.

324 li. was received for interest money lent a Merchant Adventurer at 17 l. in the hundred one year, what was the sum lent? Answer, divide 32400 by 17, makes 1909 l. and 1; 17 of a pound.

10 Example.

If 358 ells of Holland cost 124 li. 16 shillings, how shall it be sold an ell to gain 12 li. in the hundred ready money? First, multiply 124 li. 8 primes by 12, adding 2 cyphers, makes 139 pound 776, or in coin 139 pound 15 shillings 6 pence. Secondly, divide

338

Decimal Arithmetick.

divide 139 li. 776 by 358, makes 390, fourths, or 7 s. 9 d. 3 q. for the price to sell one ell to gain 12 l. in the hundred.

Example.

l. 1.2.3	
124 800	
12	
14 976	
139 776	

22	
3235	1235
239 7766	(3905
358888	
3555	
33	

II Example.

If one ell of cloth cost 18 d. how shall I sell 385 ells to gain 7 l. 10 s. by the bargain, and at what rate in the hundred do I gain? First, 358 ells at 18 d. an ell, makes 26 l. 17 s. to the which I add 7 l. 10 s. the gains makes 34 l. 7 s. for to sell 358 ells to gain 7 l. 10 s. by the bargain. Secondly, divide 7 l. 500000 sixths by 26 l. 85 seconds, and the quotient is 27 l. 9346 fourths, or 27 l. 18 s. 8 d. q. which is the rate gained by the 100 l. of money.

Example.

Example.

Ells.	d.	
358	18	
75		2878
<hr/>		
1790		213088
2506		78000000 (27 2346
<hr/>		268888
26850		266
715		2
<hr/>		
34 35 price.		

12 Example.

How much Indico of 6 s. 3 d. a pound will pay for 73 Broad cloths at 16 l. one cloth; and to pay 60 pound in present money? First 73 Broad cloths at 16 l. a cloth, makes 1168 l. from which subtract 60 l. there will remain 1108 l. which divide by 6 s. 3 d. or 3125 fourths, and the quotient is 3545 pound, 6:10 one of one pound, and so much must he give of Indico for the clothes.

Example

Example.

73	x		
16	x88		
<hr/>			
438	x4387		
73	x70880000	l.	l.
<hr/>			
1168	x10800000	(3545	6:10
60	x22222		
<hr/>			
1108	x33		

13 Example.

How many pound of Cloves at 6 s. a pound, and small Cinnamon of 3 s. a pound, must be given for 36 Kerseys at 4 l. 3 s. a piece, to have of each a like number of pounds? Answer, 36 Kerseys at 4 l. 3 s. a piece, makes 149 l. 8 s. which divided by the price of both, viz. 9 s. makes 332 pound of each sort.

The proof: 332 pound of Cloves at 6 s. a pound, makes 99 l. 12 shillings, then 332 pound of Cinnamon at 3 shillings a pound makes 49 pound 16 shillings, the total is

149

Gain and Loss.

341

149 pound 8 shillings, the given price of the 36 Kerseys.

Example.

l.	1.2	
4	15	
	36	
<hr/>		449
24	90	44 4000 (332% of each.
124	5	4555
<hr/>		44
149	4	

14 Example.

Of what principal came 1000 *li.* principal and interest, at compound interest in three years at 6 pound in the hundred? Divide 1000 pounds three several times by 106, makes 839 pound 62 seconds, or 839 pound 12 shillings 3 pence almost, which was the sum lent at first.

Example.

$$\begin{array}{r}
 342 \\
 246622 \\
 200000 | 000 \quad (943 | 390000 \\
 20666666 \\
 200000 \\
 2222
 \end{array}$$

$$\begin{array}{r}
 9109 \\
 9116 \\
 943 | 90000 \quad (889990 \\
 2066666666 \\
 200000 \\
 22222
 \end{array}$$

$$\begin{array}{r}
 2066 \\
 42244 \quad 1. \quad 1 \\
 889990 \quad 839 \quad 6 \\
 206666 \\
 2000 \\
 22
 \end{array}$$

15 Example.

If 34 Tun of Wine cost 544 l. how may a man sell a Tun to gain 12/. upon the 100 ready money? First, find the price of one

one Tun dividing 544 by 34, makes 16 *l.* for the price of one Tun which it cost: then multiply 16|00 by 12 *l.* makes 17 *li.* 92 seconds, or 17 *l.* 18 *s.* 4 *d.* 4 *s.* of a penny, for the price to sell one Tun of that Wine to gain 12 *l.* upon the 100 *l.*

28	1.	1.2
544	(16	16 00
344		12
3		<hr style="border: 0.5px solid black;"/>
		1 92
		<hr style="border: 0.5px solid black;"/>
		17 92

How to work Gain and Loss in pence and part of pence, or farthings.

Set out our number of pounds, shillings, pence, and farthings, in pence, and in tenths of one penny; and for one farthing set out 2 primes, 5 seconds, which is one fourth of a penny, and for 2 farthings set out five primes, which is one half penny: and for three farthings set down seven primes, 75 seconds, which is 3 quarters of one penny, and then they are apt for decimal operations, both for *Multiplication*, *Division*, or any

any other work of Arithmetick, without reducing them into farthings, and there will be a great deal of labour saved in these kind of operations, as shall appear afterwards by the examples following.

1 *Example.*

What is the interest and principal of 100^l. put forth at ten pound in the hundred compound interest, for the space of 7 years, to be all received at the end of the term? First, put your 100^l. into pence, maketh 2400 pence; then work as in this example following, and you shall find it will amount unto 46769 pence, and 1:5 of one penny, which is the sum that 100^l. will amount unto at interest upon interest in 7 years, at 10^l. in the hundred.

Example

Example.

100 pound makes	penoe.
—	24000
	2400
1 Year	— 26400
	26400
2 Year	— 29040
	29040
3 Year	— 31944
	31944
4 Year	— 35138
	35138
5 Year	— 38652
	38652
6 Year	— 42517
	42517
7 Year	— 46765
	46765

xxx d.

xxx s

l. |

457698 (194 8

214448

222

Total 194 l. 17 s. 5 d. 1:5

2 Example.

2 Example.

A Merchant delivered 358 *l.* at interest for 3 years, for 8% in the 100 compound interest, the question is, what it will amount unto at the end of the term? Put your money into pence, makes 85920 *d.* which multiply by 8, adding two cyphers; and work for 3 years, as in the example following.

Example.

$$\begin{array}{r}
 \text{358 pound is} \text{---} 85920 \overset{d.}{\underset{8}{|}} 00 \\
 \hline
 \text{1 Year} \text{---} 6873 \ 88 \ 92793 \overset{600}{\underset{0000}{|}} 008 \\
 \hline
 \text{2 Year} \text{---} 7423 \ 488 \ 100217 \overset{08800}{\underset{00000}{|}} 00008 \\
 \hline
 \text{3 Year} \text{---} 8017 \ 36704 \ 108231 \overset{45504}{\underset{d.}{|}}
 \end{array}$$

$$\begin{array}{r}
 \text{xx} \quad 18 \text{ d.} \quad \text{l.} \quad | \\
 \text{x} 082340 \quad (450 \ 9 \text{ or } 450 \text{ l. } 19 \text{ s. } 6 \text{ d} \\
 \text{xx} \text{xxxxx} \\
 \text{xx}
 \end{array}$$

*The proof of the former Example in
Decimals.*

A certain Merchant received for principal and interest upon interest 450 *l.* 19 *s.* 6 *d.* which was for money lent at 8% in the hundred for 3 years; now the question is, what was the sum lent? Place 450 *l.* 19 *s.* 6 *d.* in Decimals, and you will find your third quotient will be 358% wanting some few seconds, which proves the work good.

3 Example.

A Merchant lent 112 *l.* for 6 moneths, at 17% in the hundred for 12 moneths, the question is, what he shall receive? Put your money into pence, makes 2988 pence; mark out your prime line, as in the former examples, and add 2 cyphers, then multiply by 17, and take half that product for 6 moneths interest, and add unto the principal, and the total is the sum of pence which he shall receive for principal and interest at 6 moneths end.

Example.

Example.

112 pound is—26880|00
0000|17

2688|6
1881|0

4569|6 total.

2284|8 one half added.

29164|8 the sum sought.

Makes 121 l. 10 s. 4 d. 4:5 of a d.

4 *Example.*

If a pound of Cinnamon cost 4 s. ready money, how may it be sold to gain 12 li. in the hundred to give 6 moneths time? Set your 4 s. in pence, makes 48 d. then add 2 cyphers, and multiply by half the interest; and add them into one sum, and the Product will be 50 d. 88 seconds, or 4 s. 2 d. 2:25 of one penny for the price to sell one pound to gain 12 pound in the hundred for 6 moneths time.

5 *Example.*

5 Example.

$$\begin{array}{r}
 d. \mid 1.2 \\
 48 \mid 00 \\
 \hline
 \mid 6 \\
 \hline
 2 \mid 88 \\
 \hline
 50 \mid 88
 \end{array}$$

makes 50 pence, 9:10 of a penny almost,

6 Example.

If 112 pound weight of Cloves cost 33 l . 12 s . how may I sell them to gain 14 l . in the hundred, and give 4 moneths time? First, set down 33 li . 6 primes, then add 2 cyphers, and multiply by 14, makes 4 l . 704 thirds, of which take the third part, because 4 moneths is the third part of one year, which is 1 l . 568 thirds: which added into one total, makes 35 l . 3 s . 4 d . ob. for the price to sell 112 pound to give 4 moneths time, and to gain 14 pound in the hundred in 12 moneths.

5 Ex.

5 Example.

$$\begin{array}{r}
 33 \overline{) 600} \\
 \underline{14} \\
 1 \overline{) 344} \\
 \underline{3} \overline{) 36} \\
 \underline{4} \overline{) 704} \\
 \underline{1} \overline{) 568} \\
 35 \overline{) 168}
 \end{array}$$

6 Example.

If in 112 pound weight of Sugar sold for 7 l. 12 s. ready money, there were gained 11 l. in the hundred, what did one pound, cost at first penny? First divide 7 pound, 6000006 by 111 l. which is the principal and interest given, and the quotient is 6 l. 84684 fifts, which 112 l. cost ready money. Secondly, divide that quotient by 112 li. makes 61132 sixths or 14 d. 3 q. for the price that one pound cost at first penny.

7 Example.

7 Example.

If 300 pieces of Lawn cost 321 *l.* 4 *s.* how may I sell them to lose 15% in the 100? First, take the rate what one cost, by dividing 321 *l.* 2. primes by 300, makes 1 *li.* 0706666 sevenths, or 1 *l.* 1 *s.* 5 *d.* almost, for the price that one piece cost. Secondly, take the interest of 1|0706666 sevenths, at 15% in the 100, and subtract it, and then it makes 910067 sixths, or 18 *s.* 2 *d.* 2:5 of a penny, for the price to sell one piece to lose 15% in the hundred ready money. Thirdly, for the proof of this work, say, If one piece cost 910067 sixths, what will 300 pieces cost at that rate? Multiply 910067 sixths by 300, and cut off 6 figures to the right hand, makes 273 *l.* 5 *d.* almost, for the sum received for 300 pieces to lose 15 pound in the hundred.

R

Example.

Example.

$ \begin{array}{r} 22222 \\ 321 \overline{) 2000000} \\ 66666 \\ 107666600 \\ 15 \\ \hline 160599 \\ \hline 910067 \end{array} $	$ \begin{array}{r} 1.1.2.3.4.5.6 \\ (1706666 \\ 1.2.3.4.5.6 \\ 910067 \\ 300 \\ \hline 273 \overline{) 02000} \end{array} $
$ \begin{array}{r} 321 \overline{) 1.2.3} \\ 200 \\ 15 \\ \hline 48 \overline{) 18} \\ 273 \overline{) 02} \end{array} $	<i>The Proof.</i>

8 Example.

If one ell of cloth sold for 3 s. 2 d. ob. there were gained 10% in the hundred ready money, what did that ell cost? Answer, set 3 s. 2 d. ob. in Dicimals, makes 38 pence 5 primes; then divide 38 pence 5000 fourths be 100 l. makes 35 pence, the price that one ell cost.

Example

Example.

⁹
 38 | 500 (35 d. the price one cost.
 1100
 11

9 *Example.*

If in one ell of cloth sold for 35*l.* 19 se-
 conds, there were gaind 7 *l.* in the hundred
 ready mony, what did that ell cost, when
 there was 6 moneths time given? Divide
 35 *l.* 1900 fourths, by half the interest, ad-
 ding 100, which is 103 pence 5 primes,
 and the quotient is 34 *d.* the price that the
 ell cost.

⁴⁷⁴ ^{d.}
 38 | 1900 (34
 10355
 193

10 *Example.*

A Merchant lent money at 10 pound in
 the hundred for 100 pound profit for 12
 moneths, and at the end of 6 moneths he re-
 ceived principal and interest 356 *li.* the
 questionis, what was the sum lent? Divide
 356 pound by 105 pound, which is the half

R 2

year

Example.

$$\begin{array}{r}
 \text{1. 1.2.3} \\
 32 \overline{) 000} \\
 \underline{95} \\
 2 \overline{) 160} \\
 \underline{88} \\
 35 \overline{) 040}
 \end{array}
 \qquad
 \begin{array}{r}
 2 \\
 2761 \\
 370400 \\
 3777 \\
 33
 \end{array}
 \qquad
 \begin{array}{r}
 \text{1.2.3 4} \\
 (9470
 \end{array}$$

or 18 s. 11 d. ob.

Exchange in Decimals.

1 Example.

IF 1 l. sterling be 1 l. 14 s. 6 d. Flemish, what is 783 l. sterling in Flemish money? Set out 1 l. 14 s. 6 d. in Decimals, makes 1 l. 725 thirds, which multiply by 783 l. makes 1350 l. 675 thirds, or 1350 l. 13 s. 6 d.

R 3.

Ex-

Example.

$\begin{array}{r} \text{\textit{1.}}1.2.3 \\ 725 \\ 783 \end{array}$	$\begin{array}{r} \text{\textit{1.}}1.2.3 \\ 275 \\ 783 \end{array}$
$\begin{array}{r} 5175 \\ 13800 \\ 12075 \end{array}$	$\begin{array}{r} 1825 \\ 2200 \\ 1925 \end{array}$
1350677	2153.25
$\begin{array}{r} \text{\textit{1.}}1.2.3 \\ 2153.25 \\ \hline 1350675 \\ 1566000 \end{array}$	

The Proof.

2 Example.

If 1 *l.* exchange be 5 *s.* 6 *d.* what is 783 *l.*
 Set 5 *s.* 6 *d.* in Decimals, makes 275 thirds;
 which multiply by 783, makes 215 *l.* 325
 thirds, or 215 *l.* 6 *s.* 6 *d.* which added to the
 last example, is 1566 *l.* and so much is the
 double of the sum given, *viz.* of 783 *l.* be-
 cause the two prices given makes just 2 *li.*
 and this by working a second question in
 exchange the first is proved to be truly
 wrought, as appeareth in the example above.

3 Example.

If 1 pound exchange be 1 *l.* 17 *s.* 7 *d.* ob.
 what is 1000 *l.* at that rate? Set 1 *l.* 17 *s.* 7 *d.*
 ob. in Decimals, makes 1 *l.* 88125 fifths;
 then

then because 1000 hath 3 cyphers, add 3 cyphers, and cut off 5 figures, and the answer is 881 l. 5 s.

$$1881 \overline{) 1.225000}$$

4 Example.

A Merchant doth receive 134 l. 6 s. for the exchange of 100 l. sterling from *Middleborough*, what was 1 l. sterling in *Flemish* money? Place 134 l. 6 s. in Decimals, is 134 l. 3 primes; then because 100 l. hath 2 cyphers, cut off 2 figures more to the left hand, and it will be 1 l. 343 thirds; or in Coin, 1 l. 6 s. 11 d. 9. for the exchange of 1 l. at that rate.

$$\begin{array}{r|l} 1.2.3 & 1. \\ 1348 & \text{or } 1 \end{array} \quad \begin{array}{l} s. \\ 6 \end{array} \quad \begin{array}{l} d. \\ 11 \end{array} \quad \begin{array}{l} q. \\ 1 \end{array}$$

5 Example.

A Merchant doth receive 645 li. 12 s. for exchange money, at 1 l. 7 s. 6 d. for 1 l. sterling, the question is, how much sterling money he did deliver? Divide 645 l. 6 primes, by 1 l. 375 thirds, or 1 l. 7 s. 6 d. makes 469 l. 5268 fourths, or 469 l. 10 s. 6 d. 9. for the sterling money delivered.

R 4

Example.

6 Example.

If 1 *li.* sterling be 1 *li.* 7*s.* 6*d.* *Flemmish*, what is 100 *l.* *Flemmish* in sterling Coin? Divide 100 *l.* by 1 *l.* 375 thirds, makes 72 *l.* 72727 fifths, or 72 *l.* 14*s.* 6*d.* *ob.* that 100 *l.* makes.

7 Example.

If the exchange be from *Rome* to *London* at 69 *d.* sterling, one Ducat, how many Ducats shall be delivered at *Rome* for to receive 356 *l.* 16*s.* sterling at *London*? Answer, divide 356 *l.* 8 primes by 2875 fourths, which is 69 pence, and the quotient will be 1241 Ducats 3 *d.*

$$\begin{array}{r}
 3\text{ } \\
 2875 \overline{) 3568000} \\
 \underline{593000} \\
 3868000 \\
 \underline{2875000} \\
 993000 \\
 \underline{287500} \\
 715500 \\
 \underline{287500} \\
 428000 \\
 \underline{287500} \\
 140500 \\
 \underline{287500} \\
 113000 \\
 \underline{287500} \\
 113000
 \end{array}$$

1241 Ducats, and there remains 3 *d.*

8 Example.

If the exchange be from *London* to *Antwerp* at 23 *s.* 5*d.* 3*q.* *Flemmish* the *li.* sterling, how much money must be delivered at *London*, to receive 146 *l.* 14*s.* 10*d.* 3*q.*

Exchange:

359

in *Flemmish* money? Answer : Divide 146/. 744775 sixths, by 1 l. 3 s. 5 d. 3 q. which is 1 l. 1739582 sevenths, and the quotient is 125 l. and so much must he deliver at London, to receive 146 li. 14 s. 10 d. 3 q. in *Flemmish* Coin at that rate.

Example.

$$\begin{array}{r}
 586979 \\
 2934895 \quad 1. \\
 \hline
 146 \overline{) 744775} \quad (125 \\
 \underline{1173958} \\
 1173958 \\
 \underline{117395}
 \end{array}$$

9 *Example.*

A Merchant doth deliver at *Antwerp* 200 l. *Flemmish* by exchange at *London*, at 22 s. 10 d. *Flemmish*, for 1 l. sterling; how much must he receive at *London*? Answ. Divide 200/. by 1 pound, 1416666 sixths, which is 22 s. 10 d. makes 175 l.

A general Rule for exchange in Decimals.

If the price of a unite be given, then always divide the sum of money whereon the question dependeth by that unite in Decimals, and the quotient is the answer to the question.

R 5

1 Ex-

4 Example.

A Merchant at *Venice* doth deliver 800 Ducats by exchange at *London*, at 64 *d. ob.* the Ducat sterling money, the question is how much sterling he must receive at *London*? Set out 64 *d. ob.* in decimals, makes 26875 fiftths; which multiply by 800, and cut off 5 figures, because your fractions are 5, and the product will be 215 *l.* sterling.

$$\begin{array}{r} 1.2.3.4.5 \\ 26\overline{)875} \\ 800 \end{array}$$

215|00000
makes 215 pound sterling.

5 Example

A Merchant doth deliver 1000 Ducats by exchange for *London*, at 71 *d.* sterling money at *London*? Set out 71 *d.* in decimals, 2958 fourths, 1:3, and add 3 cyphers for 1000, and cut off 4 figures, makes 295 *l.* 8 primes, 1:3, or 295 *l.* 16 *s.* 8 *ds.* for the answer.

1. |
295 8000 makes 295 *l.* 8 primes, 1:3.

6 Examples

6 Example.

One penny *Flemmish* is 3:5 of one penny sterling, and 1 pound *Flemmish* is 3:5 of 1*l.* sterling, or 12*s.* wherefore to convert *Flemmish* money into sterling Coyn, multiply your *Flemmish* money by 3:5, which in Decimals is 6:10, or 6, and the product will be the value of your *Flemmish* money in sterling Coin. In 345 *Flemmish*, how much sterling Coin? Multiply 345 by 6 primes, and the product is 207 pound sterling.

$$\begin{array}{r}
 \text{In } 345 \text{ } \overset{l.}{\mid} \overset{1}{6} \\
 \hline
 207 \mid 0
 \end{array}
 \qquad
 \begin{array}{r}
 \text{In } 7156 \text{ } \overset{li.}{\mid} \overset{1}{6} \\
 \hline
 4714 \mid 08
 \end{array}$$

7 Example.

In 756*l.* 18*s.* sterling, how much *Flemmish* Coin, when 1 penny *Flemmish* is 3:5 of a penny *English*? divide 756*l.* 9 primes by 6 primes, makes 1261*li.* 5 primes, or 10*s.*

$$\begin{array}{r}
 1261 \text{ } \overset{li.}{\mid} \overset{1}{5} \\
 756 \mid 90 \\
 \hline
 868 \mid 66
 \end{array}$$

Reduction.

Reduction of Measures from one place to another.

IF you will reduce the measure of one Country into the measure of another; as if you would reduce the measures of *Antwerp*, *Gannt*, *Bruges*, *Sivil*, *Roven*, or of any other Country into the measures at *London*; learn first the order of measuring of all sorts of commodities in both places, either out of the experience of Merchants and Tradesmen in those places, or out of the best and latest approved Authors that have written Tables to that effect, and note that 4 ells at *London* makes 5 yards, and 100 ells at *London* is at

E^ls.

<i>Antwerp</i> —————	166. 2:3
<i>Gannt</i> short measure —————	164
<i>Gannt</i> long measure —————	154
<i>Bruges</i> —————	164
<i>Arras</i> —————	163
<i>Calice</i> —————	157
<i>Lisle</i> —————	166
<i>Mastrich</i> —————	173
<i>Cullen</i> —————	208
<i>Frankfort</i> —————	208
<i>Noremberg</i> —————	174
<i>Dantringe</i> —————	139
<i>Roven</i> —————	103
<i>Paris</i> —————	95
<i>Lions</i> —————	100

Genoa

<i>Genoa</i>	— — — — —	480.2:3	Palmes.
<i>Millain</i>	— — — — —	214	Braces.
<i>Florence</i>	— — — — —	188	Braces.
<i>Venice</i>	{ For Linnen hath		196 Ells.
	{ For Silk hath —		180 Ells.
<i>Rome</i>	— — — — —	56	Canas.
<i>Lisbon</i>	— — — — —	100	Varras.
<i>Madera</i>	— — — — —	104	Varras.
<i>Sivil</i>	— — — — —	135	Varras.

*These I have taken out of Masterfons
Arithmetick.*

The difference of 100 Ells, Palms, Varras, or Braces, being found of any place from *London*; if you would convert the measures of any of those places to *London* measure: as for example, if you would convert 356 ells of *Bruges* measure into ells at *London*, you shall find in the Table that 164 ells makes 100 at *London*, then by the Rule of Three say.

1 Example.

If 164 be 100, what are 356 ells? Multiply 356 by 100, and divide by 164, makes 217 ells, 12:164 of an ell, which 356 at *Bruges* will make in *London*. But according to the order of Decimals, if you will bring the measures of other places to those of *London*, set your number of one hundred found in the Table, to a unite in decimals,

as in the last example 164 stands thus 1|64 seconds ; then you need but divide your number 356 by one ell, 64 seconds, and the quotient is 217 ells, 12:164 ells, as in the last example.

Again, if you would reduce *London* measure to the measures of any other place ; find the number of 100 to that place, and set it in Decimals, and multiply your number of ells at *London* by those numbers found, and the product will be your desire.

2 Example.

In 758 ells at *London*, how many ells at *Dantzick*? I find in the Table 139 ells there, make 100 at *London*, so I set 139 to a unite, and it is one ell 39 seconds; by which I multiply 758, makes 1053 ells, 62 : 100 part.

1 Example.

~~111~~
~~2862~~ Ells
~~31800~~ (217
~~18444~~
~~166~~
~~1~~

2 Example.

758|CO
 139

 12:146 68:22
 2274
 758

 1053|62
 3 Ex-

or division, without the Golden Rule. But of this if it please God to lend me life and health, I do purpose to speak in a Treatise at large of *Decimal Arithmetick*, for the good of my Countrymen and others, if I find these my labours and indeavours to be acceptable and beneficial to others; and will better inform my self by Merchants, who have had experience in the Reduction of weights and measures from place to place: In the mean time here is a foundation laid to work upon, let the difference be what it will: And so for this time I will end this Treatise of *Decimal Arithmetick*, and go in hand with some operations of Annuities, as followeth.

O F

Of Interest and Annuities.

How to frame Tables to work Interest and Annuities, or Purchase at any rate.

FOr as much as these kinds of operations of Interest and Annuities, are very tedious and troublesome, if they be to be wrought for many years, although I have already in the former Book set forth many several manners of working those kinds of questions after a more easie kind of method then heretofore hath been published by any other in the like kind whatsoever, yet here I have thought good also in this place, to shew the ways, whereby any man that is desirous to be satisfied in the reasons or grounds of those kind of works, may be able to calculate for his own use a Table or Tables, whereby to abbreviate those kind of operations, by *Multiplication* or *Division* onely, without the help of the Golden Rule, or any tedious Reductions of *Multiplications* and *Divisions*, for many years to come, at one onely operation; as shall appear by the examples following.

How

*How to calculate the Table or Breviate of
10 pound in the hundred Compound Interest.*

If you will calculate a Table for 10 pound in the hundred compound Interest for 21 or 30 years: Place your numbers as in the examples following, beginning with a unite, or 1, adding 7 cyphers unto it, and then take the tenth part of that, which is the same numbers one room more to the right hand, and add them to the first numbers, and the total will be the sum for the first year; and so you must work for the second, third, fourth, &c. until 21 or 30 years: But here you shall note, that you shall not need to set down in your breviat more then 8, 9, or 10 numbers at the most, for because the rest will be superfluous; as for example.

Example

Example.

Inter.	1.2.3.4.5.6.7.8	Years	Inter.	1.2.3.4.5.6.7.8	Years
1	0000000000	0	2	357947699	9
	I			23579476	
1	1000000000	1	2	59374246	10
	II			25937424	
1	2100000000	2	2	85311670	11
	I2I			28531167	
1	3310000000	3	3	13842837	12
	I33I			31384283	
1	4641000000	4	3	45227121	13
	I464I			34522712	
1	6105100000	5	3	79749833	14
	I6105I			37974983	
1	7715610000	6	4	17724816	15
	I77156I			41772481	
1	9487171000	7	4	59497298	16
	I948717I			45949729	
2	1435888100	8	5	05447028	17
	2I435883			50544702	
2	3579476999	9	5	55991731	18
				55599173	
			6	I1590904	19

Here

Here you may see in this Table the manner of gathering the Breviate of 10 pound in the hundred compound interest, which you may extend to what number of years you please, onely adding a unite in the eighth place, as you see the figures in the ninth place do arise; and now I will set down the Breviate from one year unto 40 ready gathered.

The

*The Breviate of 10 pounds in the hundred
per annum, Compound Interest
for 40 years.*

<i>Years</i>	1.2.3.4.5.6.7.8	<i>Years</i>	1.2.3.4.5.6.7.8.9
1	11000000	21	740024990
2	12100000	22	814027490
3	13310000	23	895430240
4	14641000	24	984973260
5	16105100	25	108347059
6	17715610	26	119181765
7	19487171	27	131099941
8	21435888	28	144209936
9	23579476	29	158630929
10	25937424	30	174294022
11	28531167	31	191943424
12	31384283	32	211137766
13	34522712	33	232251543
14	35974983	34	255476697
15	41772481	35	281024367
16	45949729	36	309126803
17	50544702	37	240039484
18	55599173	38	374043432
19	61159090	39	411447775
20	67274999	40	452592553

How

How to calculate a Table or Breviate at any rate under or above 10 pound in the hundred compound Interest.

If you would calculate a Table or Breviate at any rate under or above 10 pound in the hundred compound Interest, place a unite with 7 cyphers to it; then if you will calculate for 12 pound in the hundred, or 16 pound, set your 12 or 16 under the two first cyphers next the unite, and multiply your unite, omitting the cyphers by your interest, and add the Product into one Total, and the sum is the principal and interest for the first year, and so work again for the second, third, &c. to finish your Table as aforefaid, at 10 pound in the 100. But if your interest be under 10 pound in the hundred, place your number of the interest under the second cypher from your unite, and work as is in the example following.

Example.

Example.

Inter.	1.2.3.4.5.6.7.8	Years	Inter.	1.2.3.4.5.6.7.8	Years
I	00000000		I	360488964	
	80			8	
I	08000000	I		10883904	
	8				
	864		I	469328005	
				8	
I	16640000	2		11754624	
	8				
	93312			5868743	6
				8	
I	25971200	3	I	7138242	
	8				
	10077690				7
I	360488965				

In this manner you may proceed infinitely. And thus much shall suffice for making of these Breviates.

The

A Breviate of 8 pound in the hundred per annum, Compound Interest for 30 years.

<i>Years</i>	1	2	3	4	5	6	7	8	<i>Years</i>	1	2	3	4	5	6	7	8
1	1	0	8	0	0	0	0	0	16	3	4	2	5	9	4	2	6
2	1	1	6	6	4	0	0	0	17	3	7	0	0	0	1	8	0
3	1	2	5	9	7	1	2	0	18	3	9	9	6	1	1	9	4
4	1	3	6	0	4	8	8	9	19	4	3	1	5	7	0	1	0
5	1	4	6	9	3	2	8	0	20	4	6	6	0	9	5	7	1
6	1	5	8	6	8	7	4	3	21	5	0	3	3	8	3	3	7
7	1	7	1	3	8	2	4	2	22	5	4	3	6	5	4	0	4
8	1	8	5	0	9	3	0	2	23	5	8	7	1	4	6	3	6
9	1	9	9	9	0	0	4	6	24	6	3	4	1	1	8	0	7
10	2	1	5	8	9	2	1	9	25	6	8	4	8	4	7	5	1
11	2	3	3	1	6	3	8	9	26	7	3	9	6	3	5	3	2
12	2	5	1	8	1	7	0	1	27	7	9	8	8	0	6	1	4
13	2	7	1	9	6	2	3	7	28	8	6	2	7	1	0	6	3
14	2	9	3	7	1	9	3	6	29	9	3	1	7	2	7	4	8
15	3	1	7	1	1	6	9	1	30	10	0	6	8	2	6	5	0

The use of these Breviates and Tables, and of all others of like nature in working of questions of Interest and Annuities.

I Rules

To find what will be the amount of one pound forborn for any number of years by compound Interest after any rate *per cent.* so that you have a Breviate for the rate proposed

fed. Enter the Breviate for the rate proposed, and find in the left margine, &c. the number of years: and from that number so found, cut off 7 figures, the answer is in pounds, primes, seconds, thirds, fourths, &c. for the answer to the question demanded.

1 Example.

What is one pound put forth at interest compound, at ten pound in the hundred worth, to be paid at the end of 18 years? Find the eighteenth number in the Breviate, which is 5|5599173; from which cut off 7 figures to the right hand, and the answer is 5 pounds 11 s. 2 di q.

Example.

l. 1.2.3.4.5.6.7

5 | 5 5 9 9 1 7 3 Make 5 l. 11 s. 2 d. q.

2 Example.

What is 100 pounds due at 7 years end worth to be paid at the end of the term, at 10 in the hundred compound interest? Find the 7th. number in the Table of ten pound in the 100, makes 19487171; to the which add two cyphers, because 100*/i.* hath two cyphers, and cut off seven figures to the right hand, and the sum is 194 l. 87 171 fifts for the answer.

l. 1.2.3.4.5

191 87 1 71 00, or 94 l. 17 s. 5 d. almost.

3 Example.

3 Example.

What will 758. for 6 years make at 10% in the hundred compound interest, to be paid at the end of the term? Find the sixth number in the Table of 10 % in the 100, which is 17715610; which multiply by 758, the money named in the question, and the product, cutting off 7 figures to the right hand, makes 1342 l. 16 s. 10 d. ob. almost.

$$\begin{array}{r}
 \begin{array}{ccccccc}
 1 & 2 & 3 & 4 & 5 & 6 & 7 \\
 17715610 & & & & & & \\
 & & & 758 & & & \\
 \hline
 141724880 & & & & & & \\
 88578050 & & & & & & \\
 124009270 & & & & & & \\
 \hline
 13428432380 & & & & & &
 \end{array}
 \end{array}$$

2 Rule.

How to find what any yearly Annuity will make to be paid all at the end of the term: First, find the number of years of the Annuity given, and from the number answering deduct a unite in the first place to the left hand, and add a cypher to the last figure to the right hand, and cut off 7 figures to the right hand, and the answer is found.

1 Example.

What will 1 pound Annuity make to be paid for at the end of the term of 16 years,

S 2

at 10

at 10%. in the hundred compound Interest? Find the sixteenth number in the Table of 10%. in the hundred, and subtract a unite from the first figure to the left hand, adding a cypher to the right hand, makes 359497290; from the which cut off 7 figures to the right hand makes 35 *l.* 18 *s.* 11 *d.* 3 farthings.

l. 1.23456
35|9407290

2 *Example.*

What will 1000 pounds annuity yearly amount unto, to be all forborn until the end of the term of 5 years, at 10 *li.* in the hundred compound Interest? Find the fifth number in the Table of 10 *li.* in the hundred, and subtract a unite from the first figure, adding a cypher in the last place, makes 61051000; then because 1000 hath 3 cyphers, add 3 cyphers, and cut off 7 figures, makes 6105 *l.* 2 *s.* for the answer.

l. 1.23.4.5.6.7
6105|10000000

3 *Example.*

What will 142 *l.* annuity make, to be paid at the end of the term of 10 years? Find the tenth number in the Breviate of 10 pound in the hundred, and subtract a unite in the first place, adding a cypher to the last, makes

makes 159374240; which multiply by 142 pound, the annuity named, and from the product cut off 7 figures to the right hand, the answer to the question is 2263 pounds, 2-shillings, 2 pence, 3 farthings.

l. 1.2.3.4.5.6.7
I 59374240
142

318748480
637466960
159374240

2263|1142080

3 Rule.

How to find what any sum of money due at the end of any number of years is worth in ready money at 10 pound in the 100 compound interest. Enter the Table of 10% in the hundred with your number of years, and the number which doth answer in the Table, is your Divisor; then add 7 cyphers to your sum of money given, to make your Dividend; then divide your Dividend by your Divisor, and the quotient, adding more cyphers, will be your answer, in pounds, primes, seconds, thirds, &c.

1 Example.

What is 1000 pound due at 7 years end worth in ready money, at 10 pound in the

S 3 100,

100 compound interest? Find the seventh number in the Table of 10%. in the 100, which is 19487171. This is your Divisor. Then add 7 cyphers to 1000 pound, makes 1000000000; or add more cyphers, marking out your prime line in your dividend, to find out how many figures your quotient will have in whole numbers, and the rest will be primes, seconds and thirds; this is your dividend, and then divide by your Divisor, makes 513 l. 3 s. 2 d.

$$\begin{array}{r}
 19487 \\
 113250 \\
 3081251 \\
 11427793 \\
 28641459795 \quad \text{1. 1.2.3} \\
 1000000000000000000 \quad (513|158 \\
 1948717111111111 \\
 19487171777777 \\
 164871111 \\
 19487111 \\
 19487
 \end{array}$$

Having found what 1000 l. due at seven years end is worth in ready money; if you will find what 100 l. or 10 l. or 1 l. is worth in ready money, place your quotient in Decimals, and mark out your prime lines, cutting off one figure for 100 l. two for 10 l. or 3 for 1 l. the answer is as followeth.

Example.

4 Example.

What is 847 pounds due at 21 years end worth in ready money, at 10 *li.* in the 100 compound interest? Find the 21 number in the Table of 10 pounds in the hundred for Divisor, which is 74002490; then set 10 cyphers to your numbers given, makes 847000000000 for your Dividend, then divide, and the quotient will be 144 *l.* 9 *s.* 1 *d.* 1:3 of 1 *d.* the answer.

Example.

$$\begin{array}{r}
 4789 \\
 411418 \\
 3371119 \\
 329721144 \\
 106975011445 \quad \text{1. 1.2.3} \\
 847000000000 \quad (114|455 \\
 7400249999999 \\
 740024999999 \\
 7400244444 \\
 7400222 \\
 74000 \\
 740
 \end{array}$$

makes 114 *l.* 9 *s.* 1 *d.* 1:3 of a penny.

4 Rule.

How to find what any yearly Annuity for any number of years is worth in ready money at 10 pounds in the hundred compound interest. Enter the Table of 10 *li.* per cent.

2 Example.

Having found what 100/. Annuitie will amount unto, if you would know what 1c/. or 1/. Annuity will amount unto, or 1000/. in 21 years; place it in Decima's, and cut off 1, 2, or add 3 cyphers to the last, or remove 3 places, and you shall find your demand.

Example.

1000 l.	100 l.
1.23	1.2.3
8648 099	864 869
8648 l. 13 s. 9 d. 3:5 864 l. 17 s. 4 d. 3:7.	

10 l.	1 l.
1.2.34	1.2.34.5
86 4869	864 869
86 l. 9 s. 8 d. 3:4 8 l. 12 s. 11 d. 1:2	

3 Example.

What is 546/. yearly Annuity for 14 years worth in ready money at 10/. in the hundred, compound interest?

Find the fourth number in the Breviate of 10/. in the hundred, from it subtract an unite in the first place, and add a cypher, makes 27974980; which multiply by 546, makes 152743407110; which divide by 37974983, the Fourteenth number in the Breviate, makes 4012 l. 4 s. 2 d. 9.

$\begin{array}{r}
 40 \\
 4208 \\
 8010897 \\
 088347552447 \quad 1. \quad 1.2.3 \\
 152743407180|000 \quad (401|211 \\
 37974983333333 \\
 379749888888 \\
 379749999999 \\
 37974444 \\
 379777 \\
 3799 \\
 37
 \end{array}$

Makes 4022 l. 4 s. 2 d. 34

If a sum of money due at the end of any number of years specified, be bought after any rate *per cent.* compound interest for a price known: to find what that sum due at the end of that term is.

I Example.

There is a Debt bought for 513 pounds, 3 shillings 2 pence ready money, which was due at 7 years end, now the question is, what the debt was at 10 l. in the hundred compound interest? Set your money paid in Decimals, makes 513|158, which multiply by 19487171, the number against 7 years, cutting off ten figures, makes 999 pounds, 999 thirds, wanting but one third of

386 *Decimal Arithmetick.*

of 1000 pounds, wherefore I conclude the debt was 1000 pounds, which was due at 7 years end.

2 Example.

There was a debt bought for 600 pounds which was due at 4 years end, what was that debt at 10 % in the hundred compound interest? Multiply 600 pounds by the numbers against 4 years, which are 1464000 makes 878 pounds, 4600000 sevenths, or in Coin 878 pounds, 6 shillings, 2 pence 2:5 of one penny for the sum of that debt.

$$\begin{array}{r}
 14641000 \\
 \quad 600 \\
 \hline
 878 | 4600000 \\
 \text{makes } 878 \text{ l. } 9 \text{ s. } 2 \text{ d. } 2:5 \text{ of a penny.}
 \end{array}$$

Thus much is thought sufficient for *Decimal Arithmetick*: In the next place followeth certain Tables exactly calculated very delightfull and necessary.

TABLES.

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7

TABLES OF Interest & Rebate:

Shewing

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Exactly what is to be allowed
for the forbearance or discount of
any Sum paid before or after it be due,
at the rate of 6 Pounds *per cent, per*
annum, according to the last Act
of PARLIAMENT.

Together,

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With divers other Tables for
the ready summing up of the
Price of any Commodity, Valuation
of Annuities, Leases, Fines, and
Reversions, &c.

BY

JOHN JOHNSON.

LONDON,

S.

Printed for *Robert Horn* at the South
Entrance of the *Royal Exchange*, 1671.

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THE ADVERTISEMENT TO THE READER.



Hereas the late Act of Parliament did prohibit the taking above the rate of 6 pounds for loan of One hundred pound for a year, and so proportionally for any sum :

And whereas those Tables for Interest formerly composed, were (for the most part) calculated after the rate of 8 *per cent.* it is thought very necessary to publish these Tables which are exactly framed at 6 *per cent. per annum*: and although they are so easie, that they need no explanation; yet lest they should seem troublesome to the meanest capacity, here are examples for the more ready understanding of them : Therefore take notice the first Table is composed to shew the just Interest at 6 *per cent. per annum* for the forbearance

T a

The Advertisement

bearance of any sum under 1000 *l.* and above 1 *s.* from one day to 12 months, wherefore if you desire to know the interest of any sum for any time, first find out the Table for the time you desire to know; under which, and against your sum, you shall find your desire. As for example, I desire to know the interest of 100 *l.* for 8 months. First, find out the Table under 8 months, then find in the first column of that Folio, your sum of an 100 *l.* and direct your eye in a streight line till you come under the 8 month, you shall find it to be 4 *l.* Secondly, I desire to know the interest of 999 *l.* for 6 months: First, find what the interest of 900 *l.* for 6 months is, then the interest of 90 *l.* for the same time; and lastly, the interest of 9 *l.* which three sums added together answers to your desire, as in this example.

<i>l.</i>		<i>l. s.</i>	<i>d q.</i>
900	is	27	0 0
90	is	2	14 0
9	is	0	5 4:3
<hr/> Total is		29	19 4:3

Thirdly, I desire to know the interest of 1966 *l.* For ten days. First, find the interest of 1000 *l.* for the said time, then of 900 *l.* then of 60 *l.* then of 6 *l.* which add together,

To the Reader.

together, give your desire, as in this example.

<i>l.</i>		<i>l.</i>	<i>s.</i>	<i>d.</i>	<i>q.</i>
1000	is	1	12	10	2
900	is	1	9	7	
60	is	0	1	11	2
6	is	0	0	2	1

which is in all the sum of 3 4 7 1

To compute the interest of any less sum than the fourth part of one penny, was thought needless; for he is counted an honest man that pays his due to a farthing: You are further to take notice that a month is taken for the twelfth part of one year, which is about 30 days and 10 hours, the year being 365 days. If you desire to know the interest of any sum above 1999 *l.* observe this direction: If it be 2000 *l.* it is but doubling the interest for 1000 *l.* or if it be 3, 4, 5, or 6000 *l.* it is but adding together the interest of 3, 4, 5, or 6 single thousands, it gives your desire. The Table of Interest followeth.

Interest at 6 per cent.

1 Day. | 2 Days. | 3 Days. | 4 Days.

1	s. d. q	s. d. q	s. d. q	s. d. q
1000	3 3 1	6 6 3	9 10 1	13 1 3
900	2 11 2	5 11 0	8 10 2	11 10 0
800	2 7 2	5 3 0	7 10 2	10 6 0
700	2 3 2	4 7 0	6 10 3	9 2 1
600	1 11 2	3 11 1	5 11 0	7 10 2
500	1 7 2	3 3 1	4 11 0	6 6 3
400	1 3 3	2 7 2	3 11 1	5 3 0
300	0 11 3	1 11 2	2 11 2	3 11 1
200	0 7 3	1 3 3	1 11 2	2 7 2
100	0 3 3	0 7 3	0 11 3	1 3 3
90	0 3 2	0 7 0	0 10 2	1 2 0
80	0 3 0	0 6 1	0 9 1	1 0 2
70	0 2 3	0 5 2	0 8 1	0 11 0
60	0 2 1	0 4 2	0 7 0	0 9 1
50	0 1 3	0 3 3	0 5 3	0 7 3
40	0 1 2	0 3 0	0 4 2	0 6 1
30	0 1 0	0 2 1	0 3 2	0 4 2
20	0 0 3	0 1 2	0 2 1	0 3 0
10	0 0 1	0 0 3	0 1 0	0 1 2
9	0 0 1	0 0 2	0 1 0	0 1 1
8	0 0 1	0 0 2	0 0 3	0 1 1
7	0 0 1	0 0 2	0 0 3	0 1 0
6	0 0 0	0 0 2	0 0 2	0 0 3
5	0 0 0	0 0 1	0 0 2	0 0 3
4	0 0 0	0 0 1	0 0 1	0 0 2
3	0 0 0	0 0 1	0 0 1	0 0 1
2	0 0 0	0 0 0	0 0 0	0 0 1
1	0 0 0	0 0 0	0 0 0	0 0 0

Interest at 6 per cent.

5 Days. | 6 Days. | 7 Days. | 8 Days.

l.	s. d. q	s. d. q	s. d.	. d. q
1000	16 5 1	19 8 2	23 0 0	26 3 2
900	14 9 2	17 9 0	20 8 2	23 8 0
800	13 1 3	15 9 1	18 4 3	21 0 1
700	11 6 0	13 9 2	16 1 1	18 4 3
600	9 10 1	11 10 0	13 9 2	15 9 1
500	8 2 2	9 10 1	11 6 0	13 1 3
400	6 6 3	7 10 2	9 2 1	10 6 0
300	4 11 0	5 11 0	6 10 3	7 10 2
200	3 3 1	3 11 1	4 7 0	5 3 0
100	1 7 2	1 11 2	2 3 2	2 7 2
90	1 5 3	1 9 1	2 0 3	2 4 1
80	1 3 3	1 6 3	1 10 0	2 1 0
70	1 1 3	1 4 2	1 7 1	1 10 0
60	0 11 3	1 2 0	1 4 2	1 6 3
50	0 9 3	0 11 3	1 1 3	1 3 3
40	0 7 3	0 9 1	0 11 0	1 0 2
30	0 5 3	0 7 0	0 8 1	0 9 1
20	0 3 3	0 4 2	0 5 2	0 6 1
10	0 1 3	0 2 1	0 2 3	0 3 0
9	0 1 3	0 2 0	0 2 1	0 2 3
8	0 1 2	0 1 3	0 2 0	0 2 2
7	0 1 1	0 1 2	0 1 3	0 2 0
6	0 1 0	0 1 1	0 1 2	0 1 3
5	0 0 3	0 1 0	0 1 1	0 1 2
4	0 0 3	0 0 3	0 1 0	0 1 1
3	0 0 2	0 0 2	0 0 3	0 0 3
2	0 0 1	0 0 1	0 0 2	0 0 2
1	0 0 0	0 0 0	0 0 1	0 0 1

Interest at 6 per cent.

9 Day. | 10 Days. | 11 Days. | 12 Days.

l	s.	d.	q	s.	d.	q	s.	d.	q	s.	d.	q
1000	29	7	0	32	10	2	36	1	3	39	5	1
900	26	7	2	29	7	0	32	6	2	35	6	0
800	23	8	0	26	3	2	28	11	0	31	6	2
700	20	8	2	23	0	0	25	3	3	27	7	1
600	17	9	0	19	8	2	21	8	1	23	8	0
500	14	9	2	16	5	1	18	0	3	19	8	2
400	11	10	0	13	1	3	14	5	2	15	9	1
300	8	10	2	9	10	1	10	10	0	11	10	0
200	5	11	0	6	6	3	7	2	3	7	10	2
100	2	11	2	3	3	1	3	7	1	3	11	1
90	2	7	3	2	11	2	3	3	0	3	6	2
80	2	4	1	2	7	2	2	10	2	3	1	3
70	2	0	3	2	3	2	2	6	1	2	9	0
60	1	9	1	1	11	2	2	2	0	2	4	1
50	1	5	3	1	7	2	1	9	2	1	11	2
40	1	2	0	1	3	3	1	5	1	1	6	3
30	0	10	2	0	11	3	1	1	0	1	2	0
20	0	7	0	0	7	3	0	8	2	0	9	1
10	0	3	2	0	3	3	0	4	1	0	4	2
9	0	3	0	0	3	2	0	3	3	0	4	1
8	0	2	3	0	3	0	0	3	1	0	3	3
7	0	2	1	0	2	3	0	3	0	0	3	1
6	0	2	0	0	2	1	0	2	2	0	2	3
5	0	1	3	0	1	3	0	2	0	0	2	1
4	0	1	1	0	1	2	0	1	2	0	1	3
3	0	1	0	0	1	0	0	1	1	0	1	1
2	0	0	2	0	0	3	0	0	3	0	0	3
1	0	0	1	0	0	1	0	0	1	0	0	1

Interest at 6 per cent.

	1 Month.				2 Months.				3 Months.			
	l.	s.	d.	q.	l.	s.	d.	q.	l.	s.	d.	q.
1000	5	0	00		10	0	00		15	0	00	
900	4	10	00		9	0	00		13	10	00	
800	4	0	00		8	0	00		12	0	00	
700	3	10	00		7	0	00		10	10	00	
600	3	0	00		6	0	00		9	0	00	
500	2	10	00		5	0	00		7	10	00	
400	2	0	00		4	0	00		6	0	00	
300	1	10	00		3	0	00		4	10	00	
200	1	0	00		2	0	00		3	0	00	
100	0	10	00		1	0	00		1	10	00	
90	0	9	00		0	18	00		1	7	00	
80	0	8	00		0	16	00		1	4	00	
70	0	7	00		0	14	00		1	1	00	
60	0	6	00		0	12	00		0	18	00	
50	0	5	00		0	10	00		0	15	00	
40	0	4	00		0	8	00		0	12	00	
30	0	3	00		0	6	00		0	9	00	
20	0	2	00		0	4	00		0	6	00	
10	0	1	00		0	2	00		0	3	00	
5	0	0	10	3	0	1	9	2	0	2	8	1
4	0	0	9	2	0	1	7	0	0	2	4	2
3	0	0	8	1	0	1	4	3	0	2	1	0
2	0	0	7	0	0	1	2	1	0	1	9	2
1	0	0	6	0	0	1	0	0	0	1	6	0
	0	0	4	3	0	0	9	2	0	1	2	1
	0	0	3	2	0	0	7	0	0	0	10	2
	0	0	2	1	0	0	4	3	0	0	7	0
	0	0	1	0	0	0	2	1	0	0	3	2

T 3

Interest at 6 per cent.

4 months.				5 months.				6 months.				
l.	l.	s.	d. q	l.	s.	d. q	l.	s.	d. q	l.	s.	d. q
1000	20	0	00	25	0	00	30	0	00			
900	18	0	00	22	10	00	27	0	00			
800	16	0	00	20	0	00	24	0	00			
700	14	0	00	17	10	00	21	0	00			
600	12	0	00	15	0	00	18	0	00			
500	10	0	00	12	10	00	15	0	00			
400	8	0	00	10	0	00	12	0	00			
300	6	0	00	7	10	00	9	0	00			
200	4	0	00	5	0	00	6	0	00			
100	2	0	00	2	10	00	3	0	00			
90	1	16	00	2	5	00	2	14	00			
80	1	12	00	2	0	00	2	8	00			
70	1	8	00	1	15	00	2	2	00			
60	1	4	00	1	10	00	1	16	00			
50	1	0	00	1	5	00	1	10	00			
40	0	16	00	1	0	00	1	4	00			
30	0	12	00	0	15	00	0	18	00			
20	0	8	00	0	10	00	0	12	00			
10	0	4	00	0	5	00	0	6	00			
9	0	3	70	0	4	60	0	5	43			
8	0	3	21	0	4	00	0	4	92			
7	0	2	92	0	3	60	0	4	21			
6	0	2	43	0	3	00	0	3	70			
5	0	2	00	0	2	60	0	3	00			
4	0	1	70	0	2	00	0	2	43			
3	0	1	21	0	1	60	0	1	92			
2	0	0	92	0	1	00	0	1	21			
1	0	0	43	0	0	60	0	0	70			

Interest at 6 per cent:

7 month ^s .				8 months.				9 months.				
l.	l.	s.	d. q	l.	s.	d. q	l.	s.	d. q	l.	s.	d. q
1000	35	0	00	40	0	00	45	0	00			
900	31	10	00	36	0	00	40	10	00			
800	28	0	00	32	0	00	36	0	00			
700	24	10	00	28	0	00	31	10	00			
600	21	0	00	24	0	00	27	0	00			
500	17	10	00	20	0	00	21	10	00			
400	14	0	00	16	0	00	18	0	00			
300	10	10	00	12	0	00	13	10	00			
200	7	0	00	8	0	00	9	0	00			
100	3	10	00	4	0	00	4	10	00			
90	3	3	00	3	12	00	4	1	00			
80	2	16	00	3	4	00	3	12	00			
70	2	9	00	2	16	00	3	3	00			
60	2	2	00	2	8	00	2	14	00			
50	1	15	00	2	0	00	2	5	00			
40	1	8	00	1	12	00	1	16	00			
30	1	1	00	1	4	00	1	7	00			
20	0	14	00	0	16	00	0	18	00			
10	0	7	00	0	8	00	0	9	00			
9	0	6	32	0	7	21	0	8	10			
8	0	5	70	0	6	43	0	7	21			
7	0	4	103	0	5	70	0	6	32			
6	0	4	21	0	4	92	0	5	43			
5	0	3	60	0	4	00	0	4	60			
4	0	2	92	0	3	21	0	3	70			
3	0	2	10	0	2	43	0	2	81			
2	0	1	43	0	1	70	0	1	92			
1	0	0	81	0	0	92	0	0	103			

Interest at 6. per cent.

	10 months.				11 months.				12 months.			
l.	l.	s.	d.	q	l.	s.	d.	q	l.	s.	d.	q
1000	50	0	00		55	0	00		60	0	00	
900	45	0	00		49	10	00		54	0	00	
800	40	0	00		44	0	00		48	0	00	
700	35	0	00		38	10	00		42	0	00	
600	30	0	00		33	0	00		36	0	00	
500	25	0	00		27	10	00		30	0	00	
400	20	0	00		22	0	00		24	0	00	
300	15	0	00		16	10	00		18	0	00	
200	10	0	00		11	0	00		12	0	00	
100	5	0	00		5	10	00		6	0	00	
90	4	10	00		4	19	00		5	8	00	
80	4	0	00		4	8	00		4	16	00	
70	3	10	00		3	17	00		4	4	00	
60	3	0	00		3	6	00		3	12	00	
50	2	10	00		2	15	00		3	0	00	
40	2	0	00		2	4	00		2	8	00	
30	1	10	00		1	13	00		1	16	00	
20	1	0	00		1	2	00		1	4	00	
10	0	10	00		0	11	00		0	12	00	
9	0	9	00		0	9	10 3		0	10	9 2	
8	0	8	00		0	8	9 2		0	9	7 0	
7	0	7	00		0	7	8 1		0	8	4 3	
6	0	6	00		0	6	7 0		0	7	2 1	
5	0	5	00		0	5	6 0		0	6	0 0	
4	0	4	00		0	4	4 3		0	4	9 2	
3	0	3	00		0	3	3 2		0	3	7 0	
2	0	2	00		0	2	2 1		0	2	4 3	
1	0	1	00		0	1	1 0		0	1	2 1	

*The use of the following Tables, of Rebate
or Discount.*

THe use of the Table for Rebate or Discount, is to know how much ought to be allowed for the paying of money before it be due, after the rate of 6 per cent. As for example, I desire to know what ought to be abated for the paying of 100 l. a month before it be due: First, seek in the Table of rebate for 1 month, then find out your sum in the first column on the left hand, and direct your eye in a straight line under the first month, you shall have your desire, which is 9 s. 11 d. 1 q. Likewise you shall find the rebate for 100 l. for 2 months, 19 s. 9 d. 2 q. For 3 months, 1 l. 9 s. 6 d. ob. Secondly, if you desire what ought to be discounted for paying of 1999 l. 10 months before it be due: First, seek the Table under 10 months, being the time desired, then seek over against 1000 l. what it comes unto, and place it as followeth: then find the rebate of 900 l. and set under that, then 90 l. and lastly, the 9 l. having found out what ought to be rebated for the particular sums, add them together, makes the sum desired.

1000 l. for 10 M. is 47:12:4:2.

900 for 10 M. is 42:17:1:2.

90 for 10 M. is 4: 5:8:2.

9 for 10 M. is 0: 8 6:3.

So that 1999 for 10 M. is 97 03:9:1.

If

Of Rebate or Discount.

If you buy Commodities to the value of 1000 *l.* to pay for them at 3 six months, that is to say, 333 *l.* 6 *s.* 8 *d.* at the end of six months, the like sum at the end of 12 months, and the third sum at the end of 18 months. First, seek what ought to be abated for 333 *l.* 6 *s.* 8 *d.* for six months, and place it thus:

300 *l.* for 6 M. is 08: 14: 9

30 *l.* for 6 M. is 0: 17: 5: 2

3 *l.* for 6 M. is 01: 8: 3

6 *s.* 8 *d.* for 6 M. is 2

being the 3d. part of 1 *l.* } 0: 0: 2: 1:

333 *l.* 6 *s.* 8 *d.* for 6 M. is 09 *l.* 14 *s.* 1 *d.* 3.

300 *l.* for 12 M. is 16: 19: 7: 1

30 *l.* for 12 M. is 01: 13: 11: 2

3 *l.* for 12 M. is 0: 3: 4: 3

6 *s.* 8 *d.* for 12 M. is 2

being the 3d. part of 1 *l.* } 0: 0: 4: 2

333: 6: 8 *d.* for 12 M. is 18 *l.* 17 *s.* 4 *d.* 0

300 *l.* for 18 M. is 24 *l.* 15: 4: 3

30 *l.* for 18 M. is 2 9: 6: 2

3 *l.* for 18 M. is 0 4: 11: 1

6 *s.* 8 *d.* for 18 M. is 0 0: 6: 2

333: 6: 8 *d.* for 18 M. is 27 *l.* 10 *s.* 5 *d.* 0

which 3 | 333: 6: 8 *d.* for 6 M. 9 *l.* 14: 01: 3

sums add | 333: 6: 8 *d.* for 12 M. 18 *l.* 17: 4:

together : | 333: 6: 8 *d.* for 18 M. 27. 10: 5:

So that 1000: 0: 0: for 3, 6 M. is 56 *l.* 01. 10. 3

B/

Of Rebate or Discount.

By which appears that there ought to be abated for the paying of 1000 *l.* before it be due, as before, 56 *l.* 1 *s.* 10 *d.* 3 *q.* which take from 1000 *l.* there remains due to be paid 943 *l.* 18. 1. The same may be done if you are to rebate for many payments, observing the same rule. If you have occasion to rebate for a greater sum, then 199 *l.* it is but doubling or trebling the rebate for such a sum as will amount to the sum desired. As if you desire to rebate for 2000 *l.* or 3000 *l.* it is but adding together what the rebate of 1000 *l.* 2 or 3 times. If you would know the rebate for any sum under 20 *s.* it may with ease be computed to the $\frac{1}{4}$ of a farthing, by knowing what is the rebate of 20 *s.* that is to say, if 20 *s.* comes to so much, then 10 *s.* is half as much, 6 *s.* 8 *d.* 1 $\frac{1}{2}$ as much, 5 *s.* $\frac{1}{4}$ as much, 4 *s.* $\frac{1}{2}$ as much, 34 $\frac{1}{8}$ as much, &c. These Examples are sufficient for the full understanding of these Tables of Discount. By what hath been said, this may be observed, that to abate 6 *l.* for 100 *l.* for 12 Months, is (though common) a great mistake, for it is but 5 *l.* 13 *s.* 2 *d.* 1. and the reason why the rebate of 100 *l.* or any other sum is not so much as the interest, will appear in this example. *A.* takes to interest of *B.* 100 *l.* and gives engagement to pay 106 *s.* at the years end; so that *A.* becomes

Of Rebate or Discount.

comes a debtor to *B.* to pay him 106 *l.* at 12 months. Now if *B.* agree with *A.* to receive his money upon discount presently: and if *B.* should allow *A.* as much for discount as for interest, then must there be allowed 6 *l.* 7 *s.* 2 *d.* 1 *q.* because that the interest of 106 *l.* is so much for a year, so that *B.* would be a loser by paying and receiving his 100 *l.* 7 *s.* 2 *d.* 1 *q.* which is the interest of 6 *l.* so that observe this for a general rule, that the rebate of any sum, and the interest thereof, is no more than the interest of that sum, that is to say, that the rebate of 106 *l.* is no more than the interest of 100 *l.* or the interest of 100 *l.* is as much as the rebate of 106 *l.* for if you are to pay a sum at time, it is supposed that the same doth include the interest for forbearance thereof until it be due; therefore if you owe a sum to pay at time, subtract the interest included in that sum. And the interest for what remains will be the just rebate thereof.

Example.

You are to pay 106 *l.* 12 months hence; the 6 *l.* must be imagined to be the interest thereof; which deduct, there remains 100 *l.* now as the interest of 100 *l.* for 12 months is 6 *l.* so the rebate of 106 *l.* for that time is no more.

Rebate at 6 per cent.

	1 month.				2 months.				3 months.			
l.	l.	s.	d.	q	l.	s.	d.	q	l.	s.	d.	q
1000	4	19	6	0	9	18	0	0	14	15	6	3
900	4	9	6	2	8	18	2	2	13	6	0	0
800	3	19	7	0	7	18	4	3	11	16	5	1
700	3	9	7	3	6	18	7	1	10	6	10	3
600	2	19	8	1	5	18	9	2	8	17	4	0
500	2	9	9	0	4	19	0	0	7	7	9	1
400	1	19	9	2	3	19	2	1	5	18	2	2
300	1	9	10	0	2	19	4	3	4	8	8	0
200	0	19	10	3	1	19	7	0	2	19	1	1
100	0	9	11	1	0	19	9	2	1	9	6	2
90	0	8	11	2	0	17	9	3	1	6	7	0
80	0	7	11	1	0	15	10	0	1	3	7	2
70	0	6	11	2	0	13	10	1	1	0	8	1
60	0	5	11	2	0	11	10	2	0	17	8	3
50	0	4	11	3	0	9	10	3	0	14	9	1
40	0	3	11	2	0	7	11	0	0	11	9	3
30	0	2	11	3	0	5	11	1	0	8	10	1
20	0	1	11	3	0	3	11	2	0	5	10	3
10	0	0	11	3	0	1	11	3	0	2	11	1
9	0	0	10	3	0	1	9	1	0	2	7	3
8	0	0	9	2	0	1	7	0	0	2	4	1
7	0	0	8	1	0	1	4	2	0	2	0	3
6	0	0	7	0	0	1	2	1	0	1	9	1
5	0	0	5	3	0	0	11	3	0	1	5	2
4	0	0	4	3	0	0	9	2	0	1	2	0
3	0	0	3	2	0	0	7	0	0	0	10	2
2	0	0	2	1	0	0	4	3	0	0	7	0
1	0	0	1	0	0	0	2	1	0	0	3	2

Rebate at 6 per cent.

	4 Months.	5 Months.	6 Months.
l.	l. s. d. q	l. s. d. q	l. s. d. q
1000	9 12 13	24 7 92	29 2 61
900	17 12 111	21 19 01	26 4 31
800	15 13 82	19 10 23	23 6 00
700	13 14 60	17 1 52	20 7 90
600	11 15 32	14 12 80	17 9 60
500	9 16 03	12 3 103	14 11 30
400	7 16 101	9 15 11	11 13 00
300	5 17 73	7 6 40	8 14 90
200	3 18 50	4 17 62	5 16 60
100	1 19 22	2 8 91	2 18 30
90	1 15 32	2 3 103	2 12 50
80	1 11 41	1 19 01	2 6 70
70	1 7 51	1 14 13	2 0 91
60	1 3 61	1 9 50	1 14 111
50	0 19 71	1 4 42	1 9 12
40	0 15 80	0 19 60	1 3 32
30	0 11 90	0 14 72	0 17 52
20	0 7 100	0 9 90	0 11 73
10	0 3 110	0 4 102	0 5 93
9	0 3 61	0 4 42	0 5 23
8	0 3 12	0 3 103	0 4 73
7	0 2 83	0 3 43	0 4 03
6	0 2 40	0 2 110	0 3 53
5	0 1 112	0 2 51	0 2 103
4	0 1 63	0 1 111	0 2 33
3	0 1 20	0 1 52	0 1 83
2	0 0 91	0 0 112	0 1 13
1	0 0 42	0 0 53	0 0 63

Rebate at 6 per cent.

	7 Months.			8 Months.			9 Months.		
ths. d.q	l.	s.	d.q	l.	s.	d.q	l.	s.	d.q
61	1000	33	16 33	38	9 23	43	1 23		
31	900	30	8 81	34	12 32	38	15 11		
00	800	27	1 03	30	15 42	34	8 113		
90	700	23	13 50	26	18 52	30	2 101		
60	600	20	5 92	23	1 61	25	16 83		
30	500	16	18 13	19	4 71	21	10 71		
00	400	13	10 61	15	7 81	17	4 53		
90	300	10	2 103	11	10 90	12	18 41		
60	200	6	15 30	7	13 100	8	12 23		
30	100	3	7 72	3	16 110	4	6 11		
50	90	3	0 101	3	9 23	3	17 60		
70	80	2	14 11	3	1 61	3	8 103		
91	70	2	7 40	2	13 100	3	0 31		
11	60	2	0 63	2	6 13	2	11 80		
12	50	1	13 93	1	18 52	2	3 03		
32	40	1	7 02	1	10 90	1	14 51		
52	30	1	0 31	1	3 02	1	5 100		
73	20	0	13 61	0	15 42	0	17 22		
93	10	0	6 90	0	7 81	0	8 70		
23	5	0	6 10	0	6 110	0	7 90		
73	8	0	5 43	0	6 13	0	6 102		
03	7	0	4 83	0	5 42	0	6 01		
33	6	0	4 02	0	4 71	0	5 20		
33	5	0	3 42	0	3 100	0	4 32		
33	4	0	2 81	0	3 03	0	3 51		
33	3	0	2 01	0	2 32	0	2 70		
33	2	0	1 40	0	1 61	0	1 82		
33	1	0	0 80	0	0 90	0	0 101		

Rebate at 6 per cent:

	10 Months.				11 Months.				12 Months.			
l.	l.	s.	d.	q.	l.	s.	d.	q.	l.	s.	d.	q.
1000	47	12	4	2	52	2	7	3	56	12	0	3
900	42	17	1	2	46	18	4	2	50	18	10	1
800	38	1	10	3	41	14	1	1	45	5	7	3
700	33	6	8	0	36	9	10	1	39	12	5	1
600	28	11	5	0	31	5	7	0	33	19	2	3
500	23	16	2	1	26	1	3	3	28	6	0	1
400	19	0	11	1	20	17	0	2	22	12	9	3
300	14	5	8	2	15	12	9	2	16	19	7	1
200	9	10	5	2	10	8	6	1	11	6	4	3
100	4	15	2	3	5	4	3	0	5	13	2	1
90	4	5	8	2	4	13	10	0	5	1	10	2
80	3	16	2	1	4	3	4	3	4	10	6	3
70	3	6	8	0	3	12	11	3	3	19	2	3
60	2	17	1	2	3	2	6	2	3	7	11	0
50	2	7	7	1	2	12	1	2	2	16	7	1
40	1	18	1	0	2	1	8	1	2	5	3	1
30	1	8	6	3	1	11	3	1	1	13	11	2
20	0	19	0	2	1	0	10	0	1	2	7	2
10	0	9	6	1	0	10	5	0	0	11	3	3
9	0	8	6	3	0	9	4	2	0	10	2	1
8	0	7	7	1	0	8	4	0	0	9	0	2
7	0	6	8	0	0	7	3	2	0	7	11	0
6	0	5	8	2	0	6	3	0	0	6	9	2
5	0	4	9	0	0	5	2	2	0	5	7	3
4	0	3	9	2	0	4	2	0	0	4	6	1
3	0	2	10	1	0	3	1	2	0	3	4	3
2	0	1	10	3	0	2	1	0	0	2	3	0
1	0	0	11	1	0	1	0	2	0	1	1	2

Rebate at 6 per cent.

	12 Months.				14 Months.				15 Months.			
	l.	s.	d.	q.	l.	s.	d.	q.	l.	s.	d.	q.
1000	61	0	7	3	65	8	4	3	69	15	4	0
900	54	18	7	0	58	17	6	3	62	15	9	3
800	48	16	6	1	52	6	8	3	55	16	3	1
700	42	14	5	2	45	15	10	2	48	16	8	3
600	36	12	4	2	39	5	0	2	41	17	2	2
500	30	10	3	3	32	14	2	1	34	17	8	0
400	24	8	3	0	26	3	4	1	27	18	1	2
300	18	6	2	1	19	12	6	1	20	18	7	1
200	12	4	1	2	13	1	8	0	13	19	0	3
100	6	2	0	3	6	10	10	0	6	19	6	1
90	5	9	10	1	5	17	9	0	6	5	6	3
80	4	17	7	3	5	4	8	0	5	11	7	2
70	4	5	5	1	4	11	7	0	4	17	8	0
60	3	13	2	3	3	18	6	0	4	3	8	2
50	3	1	0	1	3	5	5	0	3	9	9	0
40	2	8	9	3	2	12	4	0	2	15	9	3
30	1	16	7	1	1	19	3	0	2	1	10	1
20	1	4	4	3	1	6	2	0	1	7	10	3
10	0	12	2	1	0	13	1	0	0	13	11	1
9	0	10	11	1	0	11	9	1	0	12	6	2
8	0	9	9	0	0	10	5	2	0	11	1	3
7	0	8	6	2	0	9	1	3	0	9	9	0
6	0	7	3	3	0	7	10	0	0	8	4	1
5	0	6	1	0	0	6	6	2	0	6	11	2
4	0	4	10	2	0	5	2	3	0	5	6	3
3	0	3	7	3	0	3	11	0	0	4	2	0
2	0	2	5	1	0	2	7	1	0	2	9	1
1	0	1	2	0	0	1	3	2	0	1	4	2

Rebate at 6 per cent:

	16 Months.			17 Months.			18 Months.		
l.	l.	s.	d. q	l.	s.	d. q	l.	s.	d. q
1000	74	1	53	78	6	93	82	11	42
900	66	13	40	70	10	12	74	6	23
800	59	5	20	62	13	51	66	1	10
700	51	17	01	54	16	91	57	15	112
600	44	8	102	47	0	10	49	10	93
500	37	0	83	39	3	43	41	5	81
400	29	12	70	31	6	82	33	0	62
300	22	4	51	23	10	02	24	15	43
200	14	16	32	15	13	41	16	10	31
100	7	8	13	7	16	80	8	5	12
90	6	13	40	9	1	00	7	8	71
80	5	18	60	6	5	40	6	12	11
70	5	3	81	5	9	80	5	15	70
60	4	8	102	4	14	00	4	19	03
50	3	14	03	3	18	40	4	2	63
40	2	19	30	3	12	80	3	6	02
30	2	4	51	2	7	00	2	9	62
20	1	9	72	1	1	40	1	13	01
10	0	14	93	0	15	80	0	16	60
9	0	13	40	0	14	10	0	14	101
8	0	11	100	0	12	61	0	13	22
7	0	10	41	0	10	112	0	11	62
6	0	8	102	0	19	43	0	9	103
5	0	7	43	0	7	100	0	8	30
4	0	5	110	0	6	30	0	6	71
3	0	4	51	0	4	81	0	4	111
2	0	2	112	0	3	12	0	3	32
1	0	1	53	0	1	63	0	1	73

Rebate at 6 per cent.

| 9 Months. | 20 Months | 21 Months.

l.	l. s. d. q	l. s. d. q	l. s. d. q
1000	86 15 13	90 18 20	95 6 51
900	78 1 72	81 16 41	85 10 43
800	69 8 12	72 14 62	76 0 41
700	60 14 71	63 12 82	66 10 33
600	52 1 10	54 10 103	57 0 31
500	43 7 63	45 9 10	47 10 22
400	39 14 03	36 7 31	38 0 20
300	26 0 62	27 5 51	28 10 12
200	17 7 01	18 3 72	19 0 10
100	8 13 60	9 1 93	9 10 02
90	7 16 13	8 3 73	8 11 01
80	6 18 93	7 5 51	7 12 01
70	6 1 52	6 7 31	6 13 01
60	5 4 11	5 9 10	5 14 01
50	4 6 90	4 10 103	4 15 01
40	3 9 43	3 12 82	3 16 01
30	2 12 03	2 14 62	2 17 00
20	1 14 81	1 16 41	1 18 00
10	0 17 40	0 18 20	0 19 00
9	0 15 71	0 16 41	0 17 11
8	0 13 102	0 14 62	0 15 21
7	0 12 13	0 12 82	0 13 32
6	0 10 43	0 10 103	0 11 43
5	0 8 80	0 9 10	0 9 60
4	0 6 111	0 7 31	0 7 70
3	0 5 21	0 5 51	0 5 81
2	0 3 52	0 3 72	0 3 92
1	0 1 83	0 1 92	0 1 103

Rebate at 6 per cent:

	22 Months.				23 Mouths.				24 Months.			
	l.	s.	d.	q	l.	s.	d.	q	l.	s.	d.	q
100	99	1	11	3	103	2	9	1	107	2	10	1
900	89	3	9	1	92	16	6	0	96	8	6	3
800	79	5	7	0	82	10	2	2	85	14	3	1
700	69	7	4	2	72	3	11	1	75	0	0	0
600	59	9	2	1	61	17	8	0	64	5	8	2
500	49	10	11	3	51	11	4	2	53	11	5	0
400	39	12	9	2	41	5	1	1	42	17	1	2
300	29	14	7	0	30	18	10	0	32	2	10	1
200	19	16	4	3	20	12	6	0	21	8	6	3
100	9	18	2	1	10	6	3	1	10	14	3	1
90	8	18	4	2	9	5	7	3	9	12	10	5
80	7	18	6	2	8	5	0	1	8	11	5	0
70	6	18	8	3	7	4	4	2	7	10	0	0
60	5	18	11	0	6	3	9	0	6	8	6	3
50	4	19	1	0	5	3	1	2	5	7	1	2
40	3	19	3	1	4	2	6	0	4	5	8	2
30	2	19	5	2	3	1	10	2	3	4	3	1
20	1	19	7	2	2	1	3	0	2	2	10	1
10	0	19	9	3	1	0	7	2	1	1	5	0
9	0	17	10	0	0	18	6	3	0	19	3	1
8	0	15	10	1	0	16	6	0	0	17	1	2
7	0	13	10	1	0	14	5	1	0	15	0	0
6	0	11	10	2	0	12	4	2	0	12	10	1
5	0	9	10	2	0	10	3	3	0	10	8	2
4	0	7	11	0	0	8	3	0	0	8	6	3
3	0	5	11	1	0	6	2	1	0	6	5	0
2	0	3	11	2	0	4	1	2	0	4	3	1
1	0	1	11	3	0	2	0	3	0	2	1	2

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*Of the following Table of Accounts ready cast
up, and the various use thereof.*

THe use of the following Table of Accounts ready cast up, are many. First, if you buy any Commodity by weight, pound, hundred, or the like; or by the Ell, as Yard, Foot, Inch; or measure, as by the Peck, Bushel, Sack, Quarter, or the like, knowing what you give for one Pound, Ell, Bushel, &c. the Table shews what any number of Pounds, Ells, or bushels come unto at the same rate. As for example, I buy a thousand yards of Packthread at a farthing a Yard, how much cometh the thousand Yards unto? First, seek in the Table, and find over head 1 farthing, and then find your number in the margin, and in a direct line over against your number, under 1 farthing is 1 l. 0 s. 10 d. the sum desired. Secondly, I desire to know what 1436 Ells of Linnen at 7 d. the Ell comes unto: Seek in the head of the Table for 7 d. then seek what 1000 times 7 d. is, and place it as in the following Example.

11

1000

			<i>l.</i>	<i>s.</i>	<i>d.</i>
1000	7 <i>d.</i> is	29	3	4	
400	7 <i>d.</i> is	11	3	4	
30	7 <i>d.</i> is	0	17	6	
6	7 <i>d.</i> is	0	3	6	
<hr/>					
1436	7 <i>d.</i> is	41	7	8	

Then seek in the same Table for 400, then for 30, and lastly for 6, add them together, gives your desire, as in the foregoing example.

Thirdly, If I buy or sell 1999 foot of timber at 4 *d.* 3 farthings the foot, what will the whole cost?

First, Seek what 1999 4 *d.* comes unto, and then what 1999 3 farthings comes unto, and add them together, gives your desire, as in this example.

		<i>l.</i>	<i>s.</i>	<i>d.</i>	<i>q.</i>
1000	4 <i>d.</i> is	16	13	4	
900	— is	15	0	0	
90	— is	1	10	0	
9	— is	0	3	0	
1000	3 farth. is	3	2	6	
900	— is	2	16	3	
90	— is	0	5	7	2
9	— is	0	0	6	3
<hr/>					
The total is		39	11	3	1

If you desire to know what any quantity of

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city
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Poun
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or P
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4 *l.* 3
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of commodity comes unto at a greater rate than 1 s. the pound, &c. First, seek what it comes unto at 1 s. and you may with ease know how much it comes unto at more: for two shillings is double, 3 shillings is treble, four shillings is four times as much; which is so easie, that to expect them ready cast up to hand, would suppose much weakness. By these examples the meanest capacity may find what any quantity of any thing comes unto, at what price soever the Pound, Ell, Yard, &c. By this Table also you may readily reduce Farthings or Pence into Pounds; so to do you must suppose the first column of numbers to be either Farthings or Pence. As for example; If I desire to know how much 1000 farthings is: First, find 1000 in the first column, and under 1 q. you shall find 1 l. 10 d. your desire. 1000 half pence is 2 l. 1 s. 8 d. 1000 pence, seek under the Table 1 peny, you will find to be 4 l. 3 s. 4 d. 1647 pence makes by the Table as followeth:

	<i>l.</i>	<i>s.</i>	<i>d.</i>
1000 is	4	3	4
600 is	2	10	0
40 is	0	3	4
7 is	0	0	7
<hr/>			
<i>The Total is</i>	6	17	3
		V 2	

Further

Further may be known by this Table the Interest of any sum of money at five pound *per cent. per annum*, if you do but suppose the pence in the head of the Table, to stand for so many months, and the number in the first column to be pounds: As for Example, I desire to know the Interest of 169 l. for 10 months: Seek the Table where 10 d. stands over head, and there you shall find over against each sum, as followeth, 100 l. to come unto 4 l. 3 s. 4 d. 60 l. to 2 l. 10 d. 0. and 9 l. to 7 s. 6 d. which add together makes 7 l. 0 s. 10 d. being the Interest of 169 l. for 10 months. If you desire to know what the Interest of any sum comes unto at 10 *per cent.* it is but doubling 5 *per cent.* Manifold uses may be made of this Table of Account ready cast up, but I leave the further explanation to the ingenious.

[Faint, illegible text, likely bleed-through from the reverse side of the page.]

100	4	3	4
60	2	10	0
9	7	6	0

1.
2000
1000
900
800
700
600
500
400
300
200
100
90
80
70
60
50
40
30
20
10
9
8
7
6
5
4
3
2
1

1 Farthing.				2 Farthings.				3 Farthings.				
l.	l.	s.	d. q	l.	s.	d. q	l.	s.	d. q	l.	s.	d. q
2000	2	1	8 0	4	3	4 0	6	5	0 0			
1000	1	0	10 0	2	1	8 0	3	2	6 0			
900	0	18	9 0	1	17	6 0	2	16	3 0			
800	0	16	8 0	1	13	4 0	2	10	0 0			
700	0	14	7 0	1	9	2 0	2	3	9 0			
600	0	12	6 0	1	5	0 0	1	17	6 0			
500	0	10	5 0	1	0	10 0	1	11	3 0			
400	0	8	4 0	0	16	8 0	1	5	0 0			
300	0	6	3 0	0	12	6 0	0	18	9 0			
200	0	4	2 0	0	8	4 0	0	12	6 0			
100	0	2	1 0	0	4	2 0	0	6	3 0			
90	0	1	10 2	0	3	9 0	0	5	7 2			
80	0	1	8 0	0	3	4 0	0	5	0 0			
70	0	1	5 2	0	2	11 0	0	4	4 2			
60	0	1	3 0	0	2	6 0	0	3	9 0			
50	0	1	2 2	0	2	1 0	0	3	1 2			
40	0	0	10 0	0	1	8 0	0	2	6 0			
30	0	0	7 2	0	1	3 0	0	1	10 2			
20	0	0	5 0	0	0	10 0	0	1	3 0			
10	0	0	2 2	0	0	5 0	0	0	7 2			
9	0	0	2 1	0	0	4 2	0	0	6 3			
8	0	0	2 0	0	0	4 0	0	0	6 0			
7	0	0	1 3	0	0	3 2	0	0	5 1			
6	0	0	1 2	0	0	3 0	0	0	4 2			
5	0	0	1 1	0	0	2 2	0	0	3 3			
4	0	0	1 0	0	0	2 0	0	0	3 0			
3	0	0	0 3	0	0	1 2	0	0	2 1			
2	0	0	0 2	0	0	1 0	0	0	1 2			
1	0	0	0 1	0	0	0 2	0	0	0 3			

1 Penny. | 2 Pence. | 3 Pence | 4 Pence.

l.	l. s. d.	l. s. d.	l. s. d.	l. s. d.
2000	8 6 8	16 13 4	25 0 0	33 6 8
1000	4 3 4	8 6 8	12 10 0	16 13 4
900	3 15 0	7 10 0	11 5 0	15 0 0
800	3 6 8	6 13 4	10 0 0	13 6 8
700	2 18 4	5 16 8	8 15 0	11 13 4
600	2 10 0	5 0 0	7 10 0	10 0 0
500	2 1 8	3 3 4	6 5 0	8 6 8
400	1 13 4	3 6 8	5 0 0	6 13 4
300	1 5 0	2 10 0	3 15 0	5 0 0
200	0 16 8	1 13 4	2 10 0	3 6 8
100	0 8 4	0 16 8	1 5 0	1 13 4
90	0 7 6	0 15 0	1 2 6	1 10 0
80	0 6 8	0 13 4	1 0 0	1 6 8
70	0 5 10	0 11 8	0 17 6	1 3 4
60	0 5 0	0 10 0	0 15 0	1 0 0
50	0 4 2	0 8 4	0 12 6	0 16 8
40	0 3 4	0 6 8	0 10 0	0 13 4
30	0 2 6	0 5 0	0 7 6	0 10 0
20	0 1 8	0 3 4	0 5 0	0 6 8
10	0 0 10	0 1 8	0 2 6	0 3 4
9	0 0 9	0 1 6	0 2 3	0 3 0
8	0 0 8	0 1 4	0 2 0	0 2 8
7	0 0 7	0 1 2	0 1 9	0 2 4
6	0 0 6	0 1 0	0 1 6	0 2 0
5	0 0 5	0 0 10	0 1 3	0 1 8
4	0 0 4	0 0 8	0 1 0	0 1 4
3	0 0 3	0 0 6	0 0 9	0 1 0
2	0 0 2	0 0 4	0 0 6	0 0 8
1	0 0 1	0 0 2	0 0 3	0 0 4

5 Pence. | 6 Pence. | 7 Pence. | 8 Pence.

l.	s.	d.	l.	s.	d.	l.	s.	d.	l.	s.	d.
2000	41	13	450	00	58	6	8	56	13	4	
1000	20	16	825	00	29	3	4	33	6	8	
900	18	15	022	10	026	5	0	30	00		
800	16	13	420	00	23	6	8	26	13	4	
700	14	11	817	10	020	8	4	23	6	8	
600	12	10	015	00	17	10	0	20	00		
500	10	8	412	10	014	11	8	16	13	4	
400	8	6	810	00	11	13	4	13	6	8	
300	6	5	07	10	08	15	0	10	00		
200	4	3	45	00	5	16	8	6	13	4	
100	2	1	82	10	02	18	4	3	6	8	
90	1	17	02	50	2	12	6	3	00		
80	1	13	42	00	2	6	8	2	13	4	
70	1	9	21	15	02	0	10	2	6	8	
60	1	5	01	10	01	15	0	2	00		
50	1	0	10	15	01	9	2	1	13	4	
40	0	16	81	00	1	3	4	1	6	8	
30	0	12	60	15	00	17	6	1	00		
20	0	8	40	10	00	11	8	0	13	4	
10	0	4	20	50	00	5	10	0	6	8	
9	0	3	90	40	00	5	3	0	6	0	
8	0	3	40	40	00	4	8	0	5	4	
7	0	2	11	03	60	4	1	0	4	8	
6	0	2	60	30	00	3	6	0	4	0	
5	0	2	10	26	00	2	11	0	3	4	
4	0	1	80	20	00	2	4	0	2	8	
3	0	1	30	10	00	1	9	0	2	0	
2	0	0	10	10	00	1	2	0	1	4	
1	0	0	50	00	00	7	0	0	0	8	

9 Pence.				10 Pence.				11 Pence.				1 shil.	
l.	l.	s.	d.	l.	s.	d.	l.	s.	d.	l.	s.	l.	s.
2000	75	00		83	6	8	91	13	4	100	0		
1000	37	10	0	41	13	4	45	16	0	50	0		
900	33	15	0	37	10	0	41	5	0	45	0		
800	30	00		33	6	8	36	13	4	40	0		
700	26	5	0	29	3	4	32	1	8	35	0		
600	22	10	0	25	0	0	27	10	0	30	0		
500	18	15	0	20	6	8	22	18	4	25	0		
400	15	00		16	13	4	18	6	8	20	0		
300	11	5	0	12	10	0	13	15	0	15	0		
200	7	10	0	8	6	8	9	3	4	10	0		
100	3	15	0	4	3	4	4	11	8	5	0		
90	3	7	6	3	15	0	4	2	6	4	10		
80	3	0	0	3	6	8	3	13	4	4	0		
70	2	12	6	2	18	4	3	4	2	3	10		
60	2	5	0	2	10	0	2	15	0	3	0		
50	1	17	6	2	1	8	2	5	10	2	10		
40	1	10	0	1	13	4	1	16	8	2	0		
30	1	2	6	1	5	0	1	7	6	1	10		
20	0	15	0	0	16	8	0	18	4	1	0		
10	0	7	6	0	8	4	0	9	2	0	10		
9	0	6	9	0	7	6	0	8	3	0	9		
8	0	6	0	0	6	8	0	7	4	0	8		
7	0	5	3	0	5	10	0	6	5	0	7		
6	0	4	6	0	5	0	0	5	6	0	6		
5	0	3	9	0	4	2	0	4	7	0	5		
4	0	3	0	0	3	4	0	3	8	0	4		
3	0	2	3	0	2	6	0	2	9	0	3		
2	0	1	6	0	1	8	0	1	10	0	2		
1	0	0	9	0	0	10	0	0	11	0	1		

A Table

(any r
thing)

One th
pound of
cost. lb

d q l

0 1 0

0 2 0

0 3 0

1 0 0

1 1 0

1 2 0

1 3 0

2 0 0

2 1 0

2 2 0

2 3 0

3 0 0

3 1 0

3 2 0

3 3 0

4 0 0

4 1 0

4 2 0

4 3 0

5 0 0

5 1 0

5 2 0

5 3 0

6 0 0

Interest at 6 per cent.

A Table shewing how much the great hundred cost at any rate the Pound, necessary for buying or selling any thing by the pound or hundred.

One the price pound of one cost. hundred			One the price pound of one cost. hundred.			One the price pound of one cost. hundred.		
d. q.	l.	s. d.	d. q.	l.	s. d.	d. q.	l.	s. d.
0 1 0	24		6 1	2 18 4		12 1	5 14 4	
0 2 0	48		6 2	3 0 8		12 2	5 16 8	
0 3 0	70		6 3	3 3 0		12 3	5 19 0	
1 0 0	94		7 0	3 5 4		13 0	6 1 4	
1 1 0	118		7 1	3 7 8		13 1	6 3 8	
1 2 0	140		7 2	3 10 0		13 2	6 6 0	
1 3 0	164		7 3	3 12 4		13 3	6 8 4	
2 0 0	188		8 0	3 14 8		14 0	6 10 8	
2 1 1	1 0		8 1	3 17 0		14 1	6 13 0	
2 2 1	3 4		8 2	3 19 4		14 2	6 15 4	
2 3 1	5 8		8 3	4 1 8		14 3	6 17 8	
3 0 1	8 0		9 0	4 4 0		15 0	7 0 0	
3 1 1	10 4		9 1	4 6 4		15 1	7 2 4	
3 2 1	12 8		9 2	4 8 8		15 2	7 4 8	
3 3 1	15 0		9 3	4 11 0		15 3	7 7 0	
4 0 1	17 4		10 0	4 13 4		16 0	7 9 4	
4 1 1	19 8		10 1	4 15 8		16 1	7 11 8	
4 2 2	20		10 2	4 18 0		16 2	7 14 0	
4 3 2	44		10 3	5 0 4		16 3	7 16 4	
5 0 2	68		11 0	5 2 8		17 0	7 18 8	
5 1 2	90		11 1	5 5 0		17 1	8 1 0	
5 2 2	114		11 2	5 7 4		17 2	8 3 4	
5 3 2	138		11 3	5 9 8		17 3	8 5 8	
6 0 2	160		12 0	5 12 0		18 0	8 8 0	

By this Table is exactly cast up how much the great hundred (viz. 112 pound cost) at any rate the pound, from one farthing to 18 pence the pound, being necessary for Retailers. First, find what your commodity cost the pound in the Table under one pound cost, and in the next Column you have the cost of one hundred at that rate. Likewise if any Commodity cost so much the hundred, in the next Column you have how much it is the the Pound after the same rate. Example, three farthings the pound is 7 s. the hundred, 10 d. farthing the pound is 4 l. 15 s. 8 d. the hundred, 8 l. 8 s. the hundred, is 18 d. the pound, 7 l. the hundred is 15 d. the pound. Likewise if a Commodity is bought or sold for more than 18 pence the pound, that is to say, for 2 s. 3 s. 5 s. or 10 s. the pound, to cast up is so easie that a Table is esteemed needless, and therefore purposely omitted.

By the
day.

Pence.

1
2
3
4
5
6
7
8
9
10
11

Shillings.

1
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5
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100

Cor
So
in

	By the day.	By the week.			By the month.			By the year.		
		l.	s.	d.	l.	s.	d.	l.	s.	d.
Pence.	1	0	0	7	0	2	4	1	10	5
	2	0	1	2	0	4	8	3	0	10
	3	0	1	9	0	7	0	4	11	3
	4	0	2	4	0	9	4	6	1	1
	5	0	2	11	0	11	8	7	12	1
	6	0	3	6	0	14	0	9	2	6
	7	0	4	1	0	16	4	10	12	11
	8	0	4	8	0	18	8	12	3	4
	9	0	5	3	1	1	c	13	13	5
	10	0	5	10	1	3	4	15	4	2
	11	0	6	5	1	5	8	16	14	7
Shillings.	1		7	c	1	8	0	18	5	c
	2		14	c	2	16	0	36	10	0
	3	1	1	0	4	4	c	54	15	c
	4	1	8	0	5	12	0	73	0	0
	5	1	15	0	7	0	0	91	5	0
	6	2	2	0	8	8	0	109	10	0
	7	2	9	c	9	16	0	127	15	0
	8	2	16	c	11	4	c	146	0	0
	9	3	3	0	12	12	0	166	5	c
	10	3	10	0	14	0	c	182	10	0
	11	3	17	0	15	8	0	200	15	0
	12	4	4	0	16	16	0	219	0	0
	13	4	11	0	18	4	0	237	5	0
	14	4	18	0	19	12	0	255	10	c
	15	5	5	0	21	0	0	273	15	0
	16	5	12	0	22	8	0	292	0	0
	17	5	19	0	23	16	0	310	5	0
	18	6	6	0	25	4	c	328	10	0
	19	6	13	0	26	12	c	346	15	0
	20	7	0	0	28	0	c	365	0	0

This Table sheweth exactly what any Sum from one Penny to one Pound
cometh unto by the Week, the Month, or the Year, so easie that it need no further
explanation.

Compute the price of one days expence
so many pounds, shillings, pence & farthings
in one year as circumstances.

*The use of the following Tables of forborn
Annuities.*

THe next Table sheweth the increase of a yearly Payment, Pension, or Rent being forborn after the rate of 6 per cent. per annum or 1, 2, 3, 4, 5, or 20 pound a year, and so for 10, 20, 30, 40, 50, or 100, 200, 300, 400, 500 pound a year. *Example.* I desire to know how much 40 s. a year would amount unto at the end of ten years, if I forbear to receive any of the said Rent or Pension; after the rate of 6 per cent. per annum. First, find out in the head of the Table two pounds, then find in the first Column ten years, and in a direct line under two pounds and against ten years, shews your desire, which is 26 l. 7 s. 2 d. and seven tenths of a penny. Again, a Pension of 20 l. per annum, forborn for 20 years, you will find in the Table to come unto 735 pound, 14 shillings, 2 d. $\frac{8}{10}$.

If you desire to know what ten, twenty, thirty, forty, or fifty pounds a year comes unto, being forborn for any terms of years under 31. multiply what one, two, three, four, or five pounds a year comes unto for your desired term of years by ten, and it shews your desire. As for example, I desire to know what fifty pounds a year, forborn for 21 years, comes to at 6 per cent. First, seek

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seek what 5 l. comes to for 21 years, which is
 199 l. 19 s. 3 d. 2 q. which multiply by ten,
 that is, only adding a cypher to each.

	l.	s.	d.
sum thus: ———	1990	190	30 20

Which reduce thus:—	1990	0	0
190 s is	9	10	0
30 d is	0	2	6
20 tenths is	0	0	2
	1999	12	8

Which added together will produce your
 desire.

— If you desire to know what 1, 2, 3, 4, of
 500 l. in a yearly payment comes unto, be-
 ing forborn for any term of years; it is but
 multiplying 1, 2, 3, 4, or 5 by 100. for the
 desired time, and it shews your desire. Ex-
 ample: I desire to know what a yearly pay-
 ment of 543 l. will come to being forborn
 for 18 years: seek what 5 l. comes unto for
 the time, which is 154. 10. 6. 7: which
 multiply by 100. that is, add two cyphers to
 every sum thus, 15400 l. 1000 s. 600 d. 700
 tenths, which reduction comes unto the four
 first sums: then seek what 4 l. a year comes
 unto for 18 years, which is 123 l. 12 s. 5 d. 4.
 which multiply by 10. only adding a cy-
 pher thus, 1230 l. 120 s. 50 d. 40. which
 add. Then seek how much 3 l. a year comes
 unto

unto for 18 years, which is 92 l. 14 s. 4 d.
 which place underneath, and the total gives
 your desire,

	l.	s.	d.
	15400	0	0
1000 s. ———	50	0	0
600 d. ———	2	10	0
700 tenths ———	0	5	10
	1230	0	0
120 s. ———	6	0	0
50 d. ———	0	4	2
40 tenths. ———	0	0	4
	92	14	4
<hr/>			
	1678	14	8

By these examples may plainly appear,
 that although the Table is but calculated
 for the yearly rent, pensions or payment of
 1, 2, 3, 4, 5, or 20 l. yet observing these di-
 rections, any yearly payment may be with
 much ease known. The Tables follow in the
 next page.

*The Digit numbers so placed, that three of
 them make 15, eight several ways.*

8	3	4
1	5	9
6	7	2

ye.	l.
1	1
2	2
3	3
4	4
5	5
6	6
7	8
8	9
9	11
10	13
11	14
12	16
13	18
14	21
15	23
16	25
17	28
18	30
19	33
20	36
21	39
22	43
23	46
24	50
25	54
26	59
27	63
28	68
29	73
30	79
31	84

1 Pound. | 2 Pound. | 3 Pound.

yr.	l.	s.	d.	10	l.	s.	d.	10	l.	s.	d.	10
1	1	0	0	0	2	0	0	0	3	0	0	0
2	2	1	2	4	4	2	4	8	6	3	7	2
3	3	3	8	0	6	7	4	1	9	11	0	1
4	4	7	5	9	8	14	11	8	13	2	5	7
5	5	12	8	9	11	5	5	1	16	18	2	7
6	6	19	6	0	13	19	0	1	20	18	6	2
7	8	7	10	5	16	15	9	0	25	3	7	5
8	9	17	11	3	19	15	10	7	29	13	10	1
9	11	9	9	9	22	19	7	8	34	9	5	7
10	13	3	7	3	26	7	2	7	39	10	10	1
11	14	19	5	1	29	18	10	3	44	18	3	5
12	16	17	4	7	33	14	9	5	50	12	2	3
13	18	17	7	7	37	15	3	4	56	12	11	1
14	21	0	3	0	42	0	7	2	63	0	10	8
15	23	5	6	2	46	11	0	4	69	16	6	6
16	25	13	5	4	51	6	10	8	77	0	4	2
17	28	4	3	0	56	8	6	1	84	12	9	2
18	30	18	1	3	61	16	2	7	92	14	4	0
19	33	15	2	3	67	10	4	7	101	5	7	1
20	36	15	8	5	73	11	5	0	110	7	1	6
21	39	19	10	2	79	19	8	4	119	19	9	7
22	43	7	10	1	86	15	8	2	130	3	6	4
23	46	19	10	9	93	19	9	9	140	19	8	9
24	50	16	3	7	101	12	7	4	152	8	11	2
25	54	17	3	4	109	14	6	9	164	11	10	4
26	59	3	1	5	118	6	3	0	177	9	4	5
27	63	14	1	3	127	8	2	7	191	2	4	1
28	68	10	6	7	137	1	1	4	205	11	8	2
29	73	12	9	5	147	5	7	1	220	18	4	6
30	79	1	1	9	158	2	3	9	237	3	5	8
31	84	16	0	4	169	12	0	8	254	8	1	2

4 Pound. | 5 Pound. | 20 Pound.

yr.	l.	s.	d.	10	l.	s.	d.	10	l.	s.	d.	10
1	4	0	0	0	5	0	0	0	20	0	0	0
2	8	4	9	6	10	6	0	0	41	4	0	0
3	12	14	8	2	15	18	4	3	63	13	5	2
4	17	9	11	6	21	17	5	5	87	9	10	1
5	22	10	11	6	28	3	8	5	112	14	10	0
6	27	18	0	2	34	17	6	3	139	10	5	5
7	33	11	6	0	41	19	4	6	167	17	6	4
8	39	11	9	5	49	9	8	9	197	18	11	8
9	45	19	3	6	57	9	1	5	229	16	6	3
10	52	14	5	5	65	18	0	9	263	12	3	8
11	59	17	8	7	74	17	1	9	299	8	7	8
12	67	9	7	1	84	6	11	9	337	7	11	7
13	75	10	6	8	94	8	2	5	377	12	10	2
14	84	1	2	4	105	1	6	0	420	6	0	3
15	93	2	0	9	116	7	7	1	465	10	4	6
16	102	13	9	6	128	7	3	6	513	9	0	1
17	112	17	0	3	141	1	3	4	564	5	1	8
18	123	12	5	4	154	10	6	7	618	2	3	1
19	135	0	9	5	168	15	11	9	675	3	11	9
20	147	2	10	1	183	18	6	7	735	14	2	8
21	159	19	5	0	199	19	3	2	799	17	1	0
22	173	11	4	5	216	19	2	7	867	16	10	9
23	187	19	7	9	234	19	6	9	939	18	3	9
24	203	5	2	9	254	1	6	6	1016	6	2	7
25	219	9	1	9	274	6	5	4	1097	5	9	6
26	236	12	6	1	295	15	7	6	1183	2	6	6
27	254	16	5	5	318	10	6	9	1274	2	3	6
28	274	2	2	9	342	12	9	7	1370	11	2	9
29	294	11	2	2	368	3	11	7	1472	15	11	0
30	316	4	7	8	395	5	9	8	1581	3	3	2
31	339	4	1	6	424	0	2	0	1696	0	8	0

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*The use of the following Tables of
Annuities.*

This following Table serveth to shew the just value of any Annuity, yearly Rent, Pension or payment, from 1 *l.* to 9 *l.* a year, and so for 10, 20, 30, 40, 50, 60, 70, 80, 90 *l.* a year, or from 100 to 900 a year, or from 1000 to 9000 *p r annum*, or for any sum desired after the rate of 6 *per cent. per annum*, for any terms of years, from 1 to 31; so that if you desire to know what any Annuity is worth ready money for any term of years under 31, it may with ease be found in the first Table following, as also many other resolutions very necessary and delightful, which will better appear in these few Examples following. I desire to know what a Lease, Annuity, or yearly payment of 6 *l.* the year, for 15 years is worth ready money, after the rate of 6 *per cent.* To be resolved of this, or the like question, first find out the yearly rent in the upper part of the Table, then your term of years in the first column, and in a direct line from 15 years in the first column under the yearly sum of 6 *l.* is your desire, that is, 58 *l.* 5 *s.* 5 *d.* and 6 tenths of a peny. 6 *l.* a year for ten years to come, is worth 44. 3. 2 $\frac{5}{10}$, 6 *l.* a year is worth after the same rate for five years to come, 25. 5. $\frac{3}{10}$. 6 *l.* a year for 31 years to come, is valued at 83 *l.* 11. 5 $\frac{3}{10}$. 1 *l.* a year for 31 years, comes unto 13 *l.* 18. 6. $\frac{2}{10}$, and 1 *l.* *per ann.*

for 21 years, comes unto 11 l. 15. s. 3 d. $\frac{3}{4}$.
 By which may be observed, that a lease or
 yearly payment after the rate of 6 per cent. for
 21 years, is 11 years and 3 quarters purchase;
 and for 31 years at the same rate near 14
 years purchase. Thus much for the finding
 the yearly value of any sum under 9 l. per
 annum. Now if you desire to know the value
 of any sum above 9 l. per annum, multiply such
 a sum by 10, 100, or 1000, as will answer
 your desire. As for example, I desire to
 know the value of a yearly payment of 50 l.
 for the term of 27 years, first seek what 5 l.
 a year comes unto, which is 66 l. 1 s. 0 d.
 $\frac{1}{2}$, which multiply by 10. that is, add a cy-
 pher to every sum thus, 660 l. 10 s. 00 d.
 60. which gives your desire, viz. 660 l. 10 s.
 6 d. Again, 90 l. per annum for 15 years,
 9 l. per an. for 15 years, is 87 l. 8. 2. $\frac{1}{2}$ which
 multiply by 10, is 870 l. 80 s. 20 d. $\frac{1}{2}$, which
 reduce thus, 870 l. 80 s. is 4 l. 20 d. is 1 s.
 8 d. and 70 tenths is 7 d. which add together,
 gives your desire, 874 l. 2 s. 3. the value of
 90 l. per annum for 15 years to come. If you
 desire to know the value of a yearly payment
 above 100 l. per annum. Example, how much
 comes 800 l. a year for 21 years to come at
 the same rate aforesaid, first find what 8 l.
 a year comes to for 21 years, which is 94 l.
 2 s. 3 d. which multiply by 100, that is, add

2 ciphers

2 ciphers
 300 d.
 300 d.
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 of 15
 7 l. per
 8.5. th
 16 yea
 31 yea
 lue of
 remain
 3 d. 5

2 ciphers to every sum thus, 9400 *l.* 200 *s.* 300 *d.* which reduce, the 200 *s.* is 10 *l.* and 300 *d.* is 25 *s.* in all 9411 *li.* 5 *s.* 6 *d.* which is the value of 800 *l.* *per annum* for 21 years. If the value of 1964 *l.* *per annum* for any term of years be desired, first find the value of 1000 *per annum*, then of 900 *l.* then of 60 *l.* *per annum*, and last of 4 *l.* for the term desired, and add them together shews your desire. If one hath a lease of a term of years, and the value of a lease of a term of years in reversion of that precedent lease be desired, first find out what the first lease is worth, and then seek what the first lease and the lease in reversion both together come unto: subtract the first leases value from the whole, the remain is the value of the lease in reversion. For example, *A.* hath a Lease for 15 years of 7 *l.* *per annum*, what is it worth at 6 *per cent.* to make up that Lease 31 years; that is to say, what is 16 years after, or in the reversion of 15 years worth? First, find the worth of 7 *l.* *per annum* for 15 years, which is 67 *l.* 19 *s.* 8 *d.* then find out what it is worth when the 16 years are added, that is 7 *l.* *per annum* for 31 years, which is 97 *l.* 10 *s.* subtract the value of 15 years from the value of 31 years, the remain is your desire, which is 29 *l.* 10 *s.* 3 *d.* 5. The Tables of Annuities follow.

The value of Annuities at 6 per cent.

1 Pound.					2 Pound.					3 Pound.				
yr.	l.	s.	d.	10	l.	s.	d.	10	l.	s.	d.	10		
1	0	18	10	4	1	17	8	8	2	16	7	2		
2	1	16	8	0	3	13	4	0	5	10	0	0		
3	2	13	5	5	5	6	11	0	8	0	4	5		
4	3	9	3	6	6	18	7	0	10	7	40	8		
5	4	4	2	9	8	8	5	9	12	12	8	9		
6	4	18	4	1	9	16	8	3	14	5	0	4		
7	5	11	7	7	11	3	3	5	16	14	11	3		
8	6	4	2	3	12	8	4	7	18	12	7	0		
9	6	16	0	4	13	12	0	8	20	8	1	2		
10	7	7	2	4	14	14	4	8	22	1	7	2		
11	7	17	8	8	15	15	5	7	23	13	2	5		
12	8	7	8	1	16	15	4	2	25	3	0	3		
13	8	17	0	6	17	14	1	2	26	11	1	9		
14	9	5	10	7	18	11	9	5	27	17	8	3		
15	9	14	2	9	19	8	5	8	29	2	8	8		
16	10	2	1	4	20	4	2	8	30	6	4	2		
17	10	9	6	5	20	19	1	0	31	8	7	6		
18	10	16	6	6	21	13	1	2	32	9	7	8		
19	11	3	1	9	22	6	3	8	33	9	5	8		
20	11	9	4	7	22	18	9	5	34	8	2	3		
21	11	15	3	3	23	10	6	7	35	5	10	1		
22	12	0	9	9	24	1	7	9	36	2	5	9		
23	12	6	0	8	24	12	1	0	36	18	2	4		
24	12	11	0	0	25	2	0	1	37	13	0	2		
25	12	15	8	0	25	11	4	0	38	7	0	0		
26	13	0	0	7	26	0	1	5	39	0	2	2		
27	13	4	2	5	26	8	5	0	39	12	7	5		
28	13	8	1	4	26	16	2	9	40	4	4	4		
29	13	11	9	7	27	3	7	5	40	15	5	3		
30	13	15	3	5	27	10	7	1	41	5	10	6		

yr.	l.
1	3
2	7
3	10
4	13
5	16
6	19
7	22
8	24
9	27
10	29
11	31
12	33
13	35
14	37
15	38
16	40
17	41
18	43
19	44
20	45
21	47
22	48
23	49
24	50
25	51
26	52
27	53
28	53
29	54
30	55
31	55

4 Pound. | 5 Pound. | 6 Pound.

yr.	l.	s.	d.	10	l.	s.	d.	10	l.	s.	d.	10
1	3	15	5	6	4	14	4	0	5	13	2	4
2	7	6	8	0	9	3	4	0	11	0	0	0
3	10	13	10	0	13	7	3	6	16	0	9	1
4	13	17	2	5	17	6	6	1	20	15	9	7
5	16	16	11	8	21	1	2	8	25	5	5	8
6	19	13	4	6	24	11	8	7	29	10	0	9
7	22	6	7	0	27	18	2	8	33	9	10	6
8	24	16	9	4	31	0	11	7	37	5	2	1
9	27	4	1	6	34	0	2	0	40	16	2	4
10	29	8	9	6	36	16	0	1	44	3	2	5
11	31	10	11	4	39	8	8	2	47	6	5	1
12	33	10	8	4	41	18	4	6	50	6	0	7
13	35	8	2	5	44	5	3	2	53	2	3	8
14	37	3	7	1	46	9	5	9	53	15	5	7
15	38	16	11	7	48	11	2	7	58	5	5	6
16	40	8	5	6	50	10	7	0	60	12	8	4
17	41	18	2	1	52	7	8	7	62	17	3	2
18	43	6	2	4	54	2	9	1	64	19	2	7
19	44	12	7	7	55	15	9	7	66	18	11	6
20	45	17	7	1	57	6	11	9	68	16	4	6
21	47	1	1	5	58	16	4	8	70	11	8	2
22	48	3	3	9	60	4	1	8	72	4	11	8
23	49	4	3	2	61	10	4	0	73	16	4	8
24	50	4	0	3	62	15	0	4	75	6	0	5
25	51	2	8	0	63	18	4	0	76	14	0	0
26	52	0	3	0	65	0	3	7	78	0	4	5
27	53	16	10	1	66	1	0	6	79	5	3	1
28	53	12	5	9	67	0	7	3	80	8	8	8
29	54	7	3	0	67	19	0	8	81	10	10	6
30	55	1	2	2	68	16	5	7	82	11	9	3
31	55	14	3	9	69	12	10	9	83	11	5	8

The value of Annuities at 6 per cent.

	7 Pound.				8 Pound.				9 Pound.			
ye	l.	s.	d.	to	l.	s.	d.	to	l.	s.	d.	to
1	6	12	0	9	7	10	11	3	8	9	9	7
2	12	16	8	0	14	13	4	1	16	10	0	1
3	18	14	2	6	21	7	8	1	24	1	1	7
4	24	5	1	3	27	14	5	0	31	3	8	6
5	29	9	8	7	33	13	11	1	37	18	2	7
6	34	8	5	1	39	6	9	2	44	5	1	4
7	39	1	6	4	44	13	2	1	50	4	9	9
8	43	9	4	4	49	13	6	8	55	17	9	1
9	47	12	2	8	54	8	3	2	61	4	3	6
10	51	10	4	9	58	17	7	3	66	4	9	7
11	55	4	1	9	63	1	10	8	70	19	7	6
12	58	13	8	8	67	1	4	9	75	9	1	1
13	61	19	4	5	70	16	5	1	79	13	5	7
14	65	1	3	5	74	7	2	3	83	13	1	1
15	67	19	8	5	77	13	11	5	87	8	2	4
16	70	14	9	9	80	16	11	3	90	19	0	7
17	73	6	9	7	83	16	4	3	94	5	10	8
18	75	15	10	3	86	12	4	9	97	8	11	6
19	78	2	1	6	89	5	3	5	100	8	5	5
20	80	5	9	4	91	15	2	2	103	4	7	0
21	82	6	11	6	94	2	3	0	105	17	6	4
22	84	5	9	8	96	6	7	8	108	7	5	8
23	86	2	5	6	98	8	6	4	110	14	7	2
24	87	17	0	6	100	8	0	6	112	19	0	7
25	89	9	8	0	102	5	5	0	115	1	0	0
26	91	0	5	3	104	0	6	0	117	0	6	8
27	92	9	5	6	105	13	8	2	118	17	10	7
28	93	16	10	3	107	4	11	8	120	13	1	3
29	95	2	8	4	108	14	6	1	122	6	3	9
30	96	7	0	9	110	2	4	4	123	17	8	0
					111	8	7	8	125	7		

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Britain C

Thistle C

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Half Pie

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A Table of the Names, Weight, and Valuation of English Gold.

The Names and Titles of the Gold. The Weight. The Value.

	Penny Weight.	Grains	s.	d.
The Royal	4	23	16	6
The half Royal	2	11	8	3
Old Noble	4	6	14	8
Half old Noble	2	4	7	4
Angel	3	8	11	0
Half Angel	1	16	5	6
Salute	2	5	6	11 ob.
Two parts of a Salute.	1	11	4	7
George Noble	3	0	9	11
Half George Noble	1	12	4	11 ob.
First Crown K. H. 8.	2	9	6	11 ob.
Base Crown K. H.	2	0	5	6
Great Sovereign	10	0	33	0
Best Sovereign K. H.	3	14	11	8
Sovereign K. H.	4	0	11	0 ob.
Edward Sovereign	3	14	11	0
Elizabeth Sovereign	3	14	11	0
Elizabeth Crown	1	19	5	6
Unites of K. James	6	10	22	0
Double Crown K. James	3	5	11	0
Britain Crown K. James	1	14	5	6
Thistle Crown K. James	1	6	4	4 ob.
Half Brit. Crown K. Jam.	0	19	2	9
Last Coin of K. Charles.	5	20	20	0
Half Piece K. Charles	2	12	10	0
Quarter Piece K. Charles	1	11	5	0

The agreement between the 100 l. weight
at London, and the weight of these places
following, collected of those which I think
have gone the nearest to the truth, being very
useful for all that do desire to know or have
occasion to make use of Forreign weight re-
duced into our weight used among us.

100 *four score*

100 l. weight at London is

qu. 10 qu.

Antwerp	96	Noremberg	90
Cullen	90	Bruges	90
Basil	90	Ausburg	95
Ulme	96	Leipzig	99
Preßlau	120	Lubeck	95
Danzig	116	Geneva	81
Roan	81	Marseilles	112
Rochel	112	Paris	91
Tholouse	110	Genoa	141
Lyons	105	Millain	141
Venice <i>small weight</i>		Padona	133
	151	Parma	139
<i>Great weight</i>	65	Ancona	130
Ferrara	133	Roma	127
Florence	131	Cicilia	142
Laguilla	143	Lisbon <i>small weight</i>	90
Castile	102		90
Frankfort	90	<i>Great weight</i>	83

THE END.

28602

$$\begin{array}{r} 128 \\ 12- \\ \hline 256 \\ 128 \end{array}$$

1/2

3 6 7 8 9 3 + 6 10
2 7 6 9 8 6 + 8 10

0 9 0 9 0 8 17 11
3 6 7 8 9 5 6 10

Conjunctio